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**METHOD, SYSTEM AND BUSINESS MODEL FOR A BUYER'S AUCTION  
WITH NEAR PERFECT INFORMATION USING THE INTERNET**

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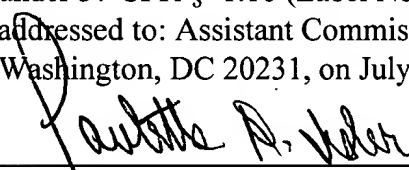
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# METHOD, SYSTEM AND BUSINESS MODEL FOR A BUYER'S AUCTION WITH NEAR PERFECT INFORMATION USING THE INTERNET

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## FIELD OF THE INVENTION

10 The present invention relates to creating a buyer's auction with near-perfect information on the World Wide Web. More particularly, the present invention is directed to: (1) a single buyer-multiple seller electronic auction methodology in which multi-attribute adjustments to buyer requests or seller offers are made in real time in response to near-perfect information for both the buyer and the sellers; (2) a comprehensive, unified system that minimizes the entire chain of transaction costs — from first desire to buy, through education, search, bargaining, and finally to the sale itself; and (3) a business model to produce and sell near-perfect proprietary information about the buyer and the sellers that derives directly and exclusively from the auction process. The total effect is to produce near-perfect, frictionless, competitive markets.

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## BACKGROUND OF THE INVENTION

### I. Introduction

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Traditional markets are burdened by many forms of inefficiency, which can be classified into two broad categories. The first category consists of the costs incurred before and during a transaction. This includes the resources spent learning about products, finding trading partners, negotiating terms, and consummating the transaction. Also included in this first category of costs is the waste that results when the transaction that is consummated is not the one that creates the most value. The second category consists of costs incurred after the transaction is consummated,

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for example the costs of monitoring performance or renegotiating terms. This invention is primarily concerned with reducing costs in the first category to the maximum degree, thereby creating near perfect, frictionless markets.

5 The transaction costs incurred prior to and during the transaction can be further divided into five types, each corresponding to an information processing problem. This invention is focused specifically on attacking each of these costs.

10 First are the *market intelligence* costs. For buyers, gathering market intelligence means learning about the products that are available and doing research about product attributes. For sellers, market intelligence consists of information about what offerings consumers are likely to demand and about what potential competitors are offering.

Second are the *search costs*. Buyers would like to identify all the sellers who can potentially meet their needs, while sellers would like to reach all the buyers whose demands they can potentially meet.

15 Third are the *bargaining costs*. The particular buyer and seller involved in each transaction must exchange enough information to be able to structure a personalized, customized deal that creates maximum value for themselves.

20 Fourth are the *sellers' transaction execution costs*. An ideal mechanism would reduce these costs, allowing the savings to be either appropriated by the seller, or shared with the buyer, or with a broker-agent (also called an "*infomediary*" in the modern e-commerce context).

Fifth are the *buyer's integration costs*. The problem of *integrating* information from disparate and disconnected sources may itself discourage buyers and sellers from becoming perfectly informed.

25 When all these costs are almost zero, it is said that there is *near-perfect information*.

In the past, markets with near-perfect information have been possible in only very limited settings outside of economics laboratories. For most consumer items, in particular, the cost of near-perfect information has been too high relative to its value to make its achievement worthwhile. The result in traditional markets has been a loss of value to both buyers, who fail to find their most preferred goods, and sellers, who lose customers they might otherwise have acquired.

However, with the advent of the Internet, the falling costs of finding, communicating, transferring and storing information is beginning to change markets dramatically. The Internet has enabled buyers and sellers to meet and transact trade in “virtual” markets. Internet-based ventures are taking advantage of the falling cost of communication to create new markets of increasing scope and scale that would have been unimaginable before the advent of the World Wide Web in the mid-1990s. For example, traditional auction markets have been adapted to the web. Familiar auction types, such as Yankee auctions and Dutch auctions, have been implemented effectively by the web-based auction houses (e.g., eBay, Onsale). The once-local classified ad and garage sale are going virtual and global. The very concept of “fixed prices” is under attack, as prices become fluid in the electronic auction environment.

Some economists and even the Chairman of the Federal Reserve Board in 1999, Alan Greenspan, have argued that this reduction in market friction can be directly translated into the high productivity and low inflation characterizing today’s economy.

Even though virtual markets are more efficient than traditional markets, they have still not evolved to the point where they can deliver results that even approach the perfect information ideal. Most e-commerce today is still based on the traditional merchant model in which sellers post fixed offers and buyers visit the sellers searching for the right product. Buyers visit one or more of these sellers to identify who can supply the needed good or service. Although successful e-commerce companies (e.g., Amazon) have emerged using this traditional posted offer, seller-

centric business model, the model does not drive any of the relevant information costs to near-zero.

5 More modern forms of markets that are more buyer-centric have also been emerging. For example, the web has allowed broader application of buyer-initiated requests that had previously been restricted to industrial requests-for-proposals (RFPs) and requests-for-quotes (RFQs). In the mass market space, RFPs and RFQs were found only in select industries such as construction. Consumers can now ask for and receive offers for a broad variety of commodities such as airline tickets (Travelocity), mortgages (e-loan), insurance (Intuit), automobiles (autobytel) and  
10 even house cleaning services (Imandi).

On the web today, independent and non-integrated solutions are being attempted to address the costs associated with market intelligence (e.g., consumer information, communities), search (directories and guides) and bargaining (auctions). However, if buyers and sellers have to visit a large number of web sites to accomplish their  
15 desired task of consummating a purchase optimized to their needs, the problem remains unsolved - the parties must still search for and integrate diverse resources. This takes time and energy, posing another barrier to efficient transactions. A complete solution should entail not only separate solutions to minimizing costs, it should also integrate those solutions within a fast, unified, easily navigated  
20 environment.

A final problem for the perfection of markets is the creation of a business model to gather and sell information. One limit to acquiring information in a bargaining situation is that the parties may want to distort their apparent preferences to improve their bargaining positions. For example, a buyer may want the seller to believe that  
25 it will not buy unless a price is significantly reduced. Two difficulties in selling information are that buyers of information may be suspicious because the quality of information cannot be verified before the information is transferred; and that it is difficult to prevent highly valued information from being resold. In current practice,

it is unusual for retail consumers to pay large sums to acquire market intelligence. Often, they expect sellers to make such information available for free.

The present invention provides a complete solution to minimizing the above types of transaction costs; unifying the buyer's experience; and creating a revenue model for the market information that both emerges from and drives the solution.

## II. The Problems to be Solved

Summarizing the foregoing discussion, today's web-based electronic commerce market contains two related problems to be solved.

First, there is the problem of minimizing five types of transaction costs — market intelligence cost, search cost, bargaining cost, sellers' transaction execution cost and buyer's integration cost. The goal is to reduce all five costs to near zero.

Second, there is the problem of constructing a business model that creates a sustainable revenue source to support the solution to the first problem.

(Note: Hereafter, female pronouns are used for the buyer and male pronouns for the seller.)

### A. *Market intelligence cost*

Before a buyer converts latent demand into a purchase, she may undergo a process of research and education about her needs. Eventually, the relevant decision criteria are settled and the buyer is ready to move ahead. The buyer develops a mental template that identifies the most important benefits and features (and those to avoid). The template is continuously refined through both casual and purposeful research until it stabilizes.

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In economic terms, the buyer invests time and energy to create a template of decision variables that describe an optimal product that matches her goals (utility function). The seller invests time, energy and money looking for buyers that best match their business goals (production function). The investment by buyers and sellers can be high.

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Despite the high value of research to buyers, Internet economics have valued research at close to zero. Even in markets such as stock trading, where presumably the value of knowledge and information is high, most firms find that they cannot successfully charge for information products. The exception is in highly specialized professions, such as journalism, medicine, law and engineering - but it is a rare phenomenon in the mass consumer market. Hence, individual buyers are left to their own random devices to gather the information necessary to make a decision. The result is usually wasted time, fatigue, confusion, and frustration - which can cause the buyer to stop learning.

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For sellers, besides learning about the buyer, they must learn enough about one another's offers to be able to match or beat their competitors. Moreover, that information must be available early enough in the process for competitors to act upon it, tailoring offers to the individual buyer in full knowledge of the competition.

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There are adverse systemic effects if the sellers do not know what offers their competitors are making or which competitors are being evaluated. A seller who thinks that he may be facing no competition or only weak competition will not be likely to offer the most favorable prices and terms to the buyer. Perfect information will motivate sellers to bid aggressively and buyers to collect multiple offers, provided the search and bargaining costs of doing so are sufficiently low.

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### ***B. Search cost***

Once the education phase is concluded and the buyer has developed a mental template, a search commences that leads to a transaction.

For buyers, search costs arise primarily from the time it takes to search through a bewildering array of commercial sites on the web for the best possible deal.

Evaluating a deal accurately involves accounting for differences in all the terms, including, without limitation, the price, product features, brand, delivery time, warranties, shipping costs, financing, and seller reputation. For sellers, search costs include marketing expenses, advertising, direct sales force salaries, and, in general, any costs associated with learning about customer needs.

Today, a buyer cannot perform a comprehensive search for relevant information about the spectrum of seller offers because there are far too many electronic merchants. Thus, a buyer will typically visit only a handful of commercial sites before accepting a (possibly) sub-optimal offer because she lacks the time to gather information about better offers.

The problems with search costs are especially acute for a buyer who is concerned about more than just price. Each seller that this buyer finds may offer a different array of options (e.g., product features, warranty, financing terms, delivery time, and shipping and handling costs) that require time-consuming evaluation and comparison by the buyer. Because more time must be spent analyzing each individual offer, this buyer will restrict her attention to even fewer sellers and remain ignorant of other, possibly better, offers.

Similarly, a seller may not attract all the buyers he could serve. For instance, a seller that emphasizes one product or service feature in advertising (because marketing data indicate that a majority of buyers value that feature) may fail to reach a substantial minority of customers that place a higher value on unadvertised aspects of the product or service. It may also happen that the buyer is unaware that the advertised product is a close substitute for the product specified in the buyer's search.

High buyer search costs not only result in high direct costs to buyers, they can also have harmful systemic consequences. To the extent that high search costs keep



buyers poorly informed about potential sellers, inefficient sellers with relatively poor products and high prices are more likely to survive in the marketplace. At the same time, relatively efficient firms will have more trouble attracting customers and will be slower to grow. In the language of economics, this means that seller entry and exit decisions will be inefficient.

As a further result, even a buyer who finds searching relatively painless will have greater difficulty finding the best deal in a sea of inferior deals, which discourages buyers from searching. Reduced buyer search activity, in turn, contributes to pricing inefficiency by sellers. Sellers that know that most buyers do not have time to search for the best deals are likely to set higher prices for all buyers, because they cannot tell the well-informed and poorly informed buyers apart.

Looking to the future, the problems associated with high search costs will only increase as the scope and diversity of electronic commerce continue to expand. Because markets function best when information is near perfect, there is tremendous economic and social value to be added by an invention that drastically reduces these costs in electronic commerce.

### *C. Bargaining cost*

Even if buyers and sellers were able to identify the right partners at zero cost, they would still face the bargaining cost of adjusting the initially offered terms to serve the parties' mutual interests. For optimal bargaining, both the buyer's priorities and the sellers' costs and business objectives must be taken into account, which requires some mechanism for the relevant transaction information to be communicated to each party and some mechanism for dynamic adjustments by buyers and sellers based on this information. Today, however, there is no practical way for sellers to adjust their offers quickly and cheaply to each buyer in response to information they have received about that particular buyer's goals, their competition for that buyer, or their own changing business rules. Similarly, there is no quick and

easy way for a buyer to communicate to sellers changes in her spectrum of buying criteria for a particular good or service.

As a result, a seller today can make mistakes because he does not know the buying behavior of a particular buyer, the buyer's purchasing criteria for a particular purchase, or who his competitors are for a particular buyer. For example, a seller may lose a much-wanted sale because he did not adjust his offer to meet a particular buyer's needs (because the seller did not know the particular needs of the particular buyer) or the seller may sell for too low a price because he did not know the offers being made by his competitors.

There is one exception to this generally negative scenario in present electronic markets: sellers learn some of the characteristics of repeat buyers. Even so, a buyer who wishes to preserve her anonymity cannot communicate her particular desires to a large number of merchants in order to fine tune the bargain. As a result, a buyer may become locked in to the sellers that know her and pay too much or settle for a less than ideal product or service because other sellers have such imperfect information.

Today, sellers often lack relevant information about particular buyers because the existing mechanisms to provide such information are too costly, too slow, and too cumbersome to be effective. Yet this information has considerable value to a seller trying to optimize his offers. Seller decisions based on direct knowledge of a buyer's needs are superior to those that rely on statistical estimates and conjectures derived from aggregate marketing data. A well-informed seller could tailor his decisions to each particular customer if he knew which features that customer valued.

To eliminate bargaining costs, there need to be mechanisms that enable each seller to fine-tune his offer to each buyer in multiple dimensions (including price, product features, warranty, financing terms, delivery time, and shipping and handling). Properly implemented, the mechanism could further reduce costs by making suggestions to sellers about substitute, alternative, or complementary

products that closely track the buyer's preferences. However, if implemented by individual sellers — each in his own way — the very richness of the seller's response could also increase buyer search costs by forcing buyers to spend more time identifying the best deal at each seller's site. Thus, there is a need for integrated systems and methods that encompass relevant sellers to reduce both search costs and bargaining costs simultaneously.

Besides the mistakes made in individual transactions, a seller's imperfect information about his customers can lead to other mistakes as well. The seller who never learns why he has lost a sale may fail to adjust his future offerings accordingly. In addition, a seller that has the potential to succeed in a market may fail to get the information he needs to learn to be successful, thereby leading that seller to make an incorrect decision to leave to the market.

From the viewpoint of overall social welfare, these seller mistakes are costly. Sellers who can most efficiently produce an offer in exactly the dimensions desired by the buyer *should* get the business, because they maximize the buyer's satisfaction while economizing on society's limited resources. In a perfect market, the efficient sellers with respect to the specific buyer at hand get her business, which is part of what makes perfect markets so desirable.

#### ***D. Sellers' transaction execution cost***

Electronic commerce had as its roots the Electronic Data Interchange initiative, which was largely developed and promoted in the 1980s. EDI is an expensive and cumbersome system of agreements between merchants to standardize the way they communicate with each other across organizational boundaries.

The World Wide Web has significantly streamlined and improved on EDI. Seller-oriented initiatives such as Extended Markup Language (XML) are unifying the exchange of electronic information between businesses. Without such standards, businesses would be unable to place purchase orders and fulfill them accurately.

On the web, because buyers and sellers can each be either individuals or businesses, an informationally perfect e-commerce environment needs to embrace both the business-to-consumer (B2C) and the business-to-business (B2B) standards.

***E. Buyer's integration cost***

5           When a buyer has to deal with multiple sites to consummate a transaction - each with its own user interface and methods - the experience can be tedious. A complete solution from the buyer's perspective should minimize all types of costs within one integrated environment, without the need to visit a number of different sites and to re-enter data at each new site. Today, however, a user who wishes to get market  
10           intelligence, conduct an exhaustive search, bargain to a successful outcome and effect a transaction would have to visit dozens, perhaps hundreds of web sites.

A common buyer response to this integration cost is to concede defeat at the outset and not shop aggressively. Recent studies indicate that nearly one third of all buyers who decide not to buy are deterred by the high cost of learning yet another  
15           user interface and entering more personal data.

Modern e-commerce sites offer convenient methods for executing transactions, e.g., Amazon's "one-click." The industry is beginning to develop standards to help minimize the overhead (time and energy) involved in consummating transactions.

20           Buyer-oriented initiatives such as Open Profiling Standards (OPS) and the E-Commerce Markup Language (ECML) are attempts to create an electronic wallet so that the buyer does not have to repeat tediously the entry of her name, address, credit card information and similar conventional data.

25           Despite these efforts, none of the prior solutions has attempted to fully integrate the entire process into one seamless experience. Instead, as described below, today's solutions remain fragmented.

### III. The Limitations of Existing Solutions

There has been progress made with respect to some of the cost categories on a piecemeal basis, using a variety of different approaches, but none of the web sites that exist today makes a systematic and integrated attempt to eliminate or reduce all five kinds of costs (i.e., market intelligence, search, bargaining, sellers' transaction execution and buyer's integration costs).

#### A. *Solutions that do not create new markets*

##### 1. Search Engines, Directories, Guides & Portals

One early attack on the problem of information costs was the search engine, which, as its name suggests, aims to reduce search costs. A search engine is a remotely accessible computer program that lets people do keyword searches for information on the Internet. For electronic commerce applications, typing a keyword or phrase that describes the desired good or service can launch a search. Search engines, however, have a number of shortcomings in providing a solution to the problems described above. In particular, buyers often find that the search results are not relevant, and visiting each web site suggested by a search engine can be a laborious and fruitless task. A search on AltaVista reveals that there are over 1,500 search engines in operation, ranging from the most comprehensive (AltaVista) to highly fragmented and specialized engines.

Several solutions have emerged to address the problem of low relevancy. Some search engines evolved into e-commerce search guides. There are hundreds of e-commerce guides on the web today. Some of these are general guides, but most specialize in a single area of e-commerce.

Guides and directories, such as LookSmart, GoTo.com, HotBot and Google, and meta-search engines that can search multiple search engines with one query, such as AskJeeves, are examples. These cover only a subset of the web and employ humans to physically check on an included web site to ensure its relevance and

content. In principle, guides are distinguished from directories by their inclusion of additional editorial content, though the line between the two can be fuzzy.

The limitation of these sites as e-commerce entities is clear to any user: relevance and coverage remain unsolved problems. Usually, after the search is conducted, the user is essentially transported to another web site to do the shopping. Moreover, even if this problem were solved, these sites still deal only with a single cost category—search costs—and even this is only addressed in a partial way.

## 2. Electronic Superstores and Transaction Aggregators

The superstore phenomenon on the web is a natural extension of the real world parallels, e.g., WalMart, Macy's and Price Club. These retail entities aggregate products and services from a wide array of vendors and present them to buyers in a consistent environment, namely the store. Physical superstores reduce search costs and travel costs by providing a single place where a buyer can find much of what she wants in a single trip.

Similarly, numerous web-based superstores have emerged. Most superstores are little more than large aggregations of e-sellers. More modern superstores add value by creating a unified answer to a buyer's search - displaying results from a number of e-merchants in a consistent fashion.

In competition with the superstores, many search engines have evolved into portals, rich in content, organized like a communication or entertainment network. In most portals, humans maintain guides to the web, thereby increasing the relevance of search results obtained using those guides. The trend is for a portal to create a network of affiliated e-merchants and thereby begin to act as a transaction aggregator, which is just a variation of the superstore concept. E-commerce has become such a critical part of the portal business model that every major portal has developed its own shopping channel, e.g., AOL Shopping, Yahoo! Shopfind, Excite Shopping and AltaVista Shopping.

In the current design of all significant superstores, when a buyer runs a search, similar products from various e-sellers are listed in a coherent manner that promotes quick comparison - at least of price. However, to effect the transaction, a buyer is still handed off to an e-seller so integration costs remain high.

5           The portal-hosted shopping channels organize a relatively small group of sellers and are thus able to create a unified look-and-feel and allow comparison shopping within their limited universe. An important limitation to such sponsored sites is the buyer's awareness that only e-merchants in the superstore are affiliates of the host. This is similar to seeing a tourist guide in a hotel featuring the best restaurants in  
10 town, only to realize that those same restaurants paid to be featured. Another important limitation of these sites is that the price and other terms of the transaction are fixed. There is no tailoring of the transaction to meet the needs of an individual buyer, so bargaining costs remain high for the buyer.

### 3. Shopping Comparison Engines & Bots

15           Price comparison engines are limited because they only cover a small subset of the web.

Product and vendor searching is the stage of e-commerce where software agents have classically been deployed in retail electronic commerce. The goal is to find items that the user wants to buy. This involves identifying appropriate vendors,  
20 comparing their products, etc. Early search agents such as *BargainFinder* (from Andersen Consulting) looked for a specific product and compared vendors based on price alone. *BargainBot* and *Fido* extended this by allowing rough matches of the product name. In the future, comparisons will most likely be conducted based on user preferences defined on a larger set of features, including price, product  
25 attributes, delivery characteristics, details of financing offered, etc. *Jango* (from NetBot, bought by Excite) and *AdHound* already allow the user to specify the product by features, but they do not support tradeoffs among features. An example of such a tradeoff would be if a consumer could accept a longer delivery time for a

lower price. Allowing the user to express tradeoffs enables the system to find the offerings that best suit the user's need. In other words, it allows the offerings to be ranked based on how desirable they are to the user. Furthermore, communicating this information on tradeoffs to the sellers allows them to redesign their offerings so as to create trades that are more desirable for both parties.

Shopping bots are a newer class of solutions that actually delegate the search and bargaining to a software process. A growing body of academic literature is focusing on e-commerce agents that can act autonomously on behalf of sellers and buyers. These software processes are not in common use because consumers are not yet willing to entrust their decisions to an automatic process.

In principle, shopping bots can reduce search costs, but they are of little use in reducing the costs in other categories. The buyer must still educate herself prior to giving instructions to the shopping bot. The bargaining costs in a negotiation between a buyer (bot) and a seller (bot) are high because the parties have incentives to misrepresent their true preferences in an attempt to get a better deal. In contrast, in a buyer's auction with near perfect information, the buyer has a strong incentive to reveal her desires accurately and the sellers are motivated to fulfill those desires as completely as possible in a cost-effective way. Finally, the integration costs for the buyer remain high because shopping bots only address a small piece of the overall problem.

### ***B. Markets without dynamic offer adjustments***

According to neoclassical economic theory, it is possible in principle to create a perfect market even with simple posted prices, in which offers are not adjusted dynamically. In that theory, each seller simply posts a fixed price for every variety of every good that he offers. Then, if the prices are market-clearing ones, which means simply that supply equals demand for each good, the outcome is Pareto efficient. In this theory, nothing can be gained from the ability to adjust offers individually to each potential customer.



Neoclassical theory had its origins as a description of commodity markets. In those markets, the goods being traded were relatively few in number, so that the same good would be purchased by many buyers. In modern e-commerce, by contrast, it is entirely possible for each customer to buy a different good, distinguished by product features, warranty, delivery terms, date, location, and so on. Indeed, there are many possible specifications that will not be purchased by any customer. For such goods, it is prohibitively expensive to list all possible varieties and their prices in advance and there is no experience which permits the parties to know the market-clearing prices. These two facts greatly limit the practical usefulness of neoclassical markets without dynamic adjustments in an economy where flexible specialization in many firms can provide a wide variety of physical products on a wide variety of terms.

Within the category of markets without dynamic offer adjustments, one can distinguish four types, which are tabulated and discussed below.

**Table 1: Markets Without Dynamic Offer Adjustments**

	<b>One Seller</b>	<b>Many Sellers</b>
<b>One Buyer</b>	1. Private sale without negotiation	4. Fixed Price RFP/RFQ
<b>Many Buyers</b>	2. Posted offers	3. Matching services

**1. Private sale without negotiation (one buyer, one seller)**

Private sales arise when the market intelligence and search costs are so large relative to the value of the transaction as to make information gathering and exchange uneconomic. In principle, they could also arise when there actually is only one potential buyer and seller and their identities are already known. Even in these situations, bargaining would normally ensue unless bargaining costs, too, are high. This unusual situation is one to which the present invention does not apply.

**2. Posted offers (many buyers, one seller)**

This is the most common form of an e-commerce market without dynamic offer adjustments. There are literally hundreds of thousands of e-commerce entities that

serve as electronic intermediaries between buyer and seller. Their whole purpose for existing is to capture the value of reduced costs of running a market.

New types of electronic infomediaries also include virtual superstores and cybermalls. Electronic superstores typically specialize in just one product category, such as books, travel, or cars. Cybermalls serve as transaction aggregators that allow a buyer to interact with a number of primary providers of goods and services.

However, all of these electronic commerce web sites deal with only pieces of the problem. The e-commerce entities described in Table 1 all conduct business without dynamic offer adjustments. They cannot, even in principle, offer a comprehensive solution to eliminating search and bargaining costs and facilitating competitive intelligence, for several reasons.

First, prices and terms for goods and services at these sites are posted and fixed. This affords no opportunity for the parties to tailor an agreement that serves the mutual interests of the buyer and seller. Sellers cannot dynamically adjust their offers to match individual buyer needs. Bargaining costs thus remain undiminished.

Second, the selection is limited to the goods and services offered by the seller(s) at that portal, superstore, or cybermall. Buyers must still make decisions based on imperfect information, i.e., there may be another portal, superstore, or cybermall with a better total offer. There is no way for buyers to compare offers with differing terms across different commercial sites. As the number of these sites grows, the transaction costs will prohibit buyers from gathering all the relevant information about the sellers at each of these sites via existing search methods. Search costs thus remain too high and bargaining costs are not reduced.

Third, sellers are forced to make decisions based on imperfect information about the buyer and the competition, because these sites provide little or no information to the seller about the buyer's priorities or the seller's competition for a particular buyer at that instant in time. Competitive intelligence is not improved.

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There are a number of existing mechanisms that sellers can use to gather information about their customers and their competition. These include hiring market research companies, subscribing to database publishers, using computer programs to monitor electronic markets, attending trade shows, and surveying their customers. These methods, however, are slow, expensive, and provide only aggregated information. They do not provide information about an individual buyer's goals or the seller's competition for a particular transaction. Thus, sellers today cannot dynamically adjust their offers for each buyer based on relevant trade information because there is no method available to gather this information in real time at low cost.

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Market mechanisms based on fixed, posted prices are inherently limited in their ability to resolve the search, bargaining, and competitive intelligence problems. When offer adjustments are made at these sites, it is usually a global price change that applies to all customers. At present, these sites cannot tailor their offers to individual buyers because this would require using a direct sales force (i.e., human intervention), a method that is prohibitively expensive for most automated, web-based businesses.

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### 3. Matching services (many buyers, many sellers)

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The classic rationale for monetizing a market (i.e., prices) is to reduce the cost of matching buyers and sellers. For markets that are inherently non-monetized, such as housing agencies, dating services and employment agencies, the role of an agent is critically important. The agent acts as infomediary.

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Computers are particularly adept at matching. A computer can process an unlimited number of variables and find the best match for a specific individual. The rapid growth of web-based employment agencies shows that even for "high touch" services, the web is an effective tool for reducing the cost of matching. Current examples include successful web sites for jobs, dating services and apartment hunting. In the future, matching services will become even more specialized.

Although matching services do lower search costs, they do not address the other components of the problem. A person still has to educate herself about what type of match she is looking for, e.g., given the broad spectrum of possible jobs, which types of jobs is she interested in matching. Matching services do not provide any form of dynamic offer adjustment. They simply bring two individuals together. The rest is a one-on-one negotiation, so bargaining costs remain high. Integration costs also remain high because matching services only address one piece of the overall problem, i.e., search costs.

#### 4. Fixed price RFPs & RFQs (one buyer, many sellers)

The oldest type of buyer's market is the Request for Proposal (RFP) or Request for Quote (RFQ) process, which predates the Internet. This process is used by large institutions such as government agencies and corporations that need to make high-value, complex purchases and can afford the transaction costs. Here, a large government or corporate buyer typically spends weeks or months developing a formal request for a proposal, which it then sends out to potential sellers. In many cases, the RFQ is only submitted to a carefully pre-qualified group of sellers. Interested sellers then spend weeks or months developing formal proposals, which are submitted to the buyer as sealed bids. The buyer then chooses the bid that most closely matches her needs. Needless to say, the RFP/RFQ process has very high transaction costs (both time and money) and often involves imperfect information between sellers (e.g., the sellers do not know each other's identities or bids).

The practical significance of the high transaction costs is reflected in the common auction features that aim to reduce these costs. One such feature is the pre-qualification and short-listing of bidders. Because preparing bids for an auction can be expensive, bidders want to be assured that they are not wasting their money preparing bids when they have no chance of winning. To the extent that evaluating bids is expensive, the buyer, too, may wish to limit bidders to those it believes can deliver on its promises.

Other features that signal high transactions costs are that the buyers in many auctions present detailed product specifications in advance or commit themselves to purchase from some bidder. These practices, too, help to protect the bidders from spending money on a fruitless cause. In the absence of significant transactions costs in the auction, one would never see pre-qualification of bidders, detailed prior specifications, or commitments by buyers.

Prior to the Internet, because of these high costs, RFPs and RFQs were primarily used for business-to-business trade. It was impractical for an individual buyer to issue personal RFPs or RFQs. The time and money that a buyer would spend contacting an indefinite number of potential sellers would far outweigh any benefit from doing so (e.g., getting better terms and conditions) for all but the largest purchases. The Internet, however, has enabled new types of buyer's markets in various industries. They all share common characteristics: the buyer creates a request by using a template provided by the infomediary or e-seller. The template is transmitted to the relevant e-sellers (unless the seller is the primary producer). The sellers respond to the buyer with a quotation. Often this process is conducted by humans and a negotiation follows in the traditional style.

There are many examples of consumer RFPs and RFQs conducted on the Internet, e.g., consumer RFQs for automobiles, air travel, mortgages and even household services. All of them have a fixed offer price - the consumer requests a quote, and the seller provides a posted offer.

These services are not designed to offer dynamic pricing. Hence, their central value is quickly matching buyers and sellers - a reduction in the search cost but not a reduction of bargaining cost. In addition, simple on-line RFPs and RFQs do not lower either market intelligence or integration costs. The buyer must educate herself beforehand and put the various pieces of the transaction together by herself.

### C. *Markets with dynamic offer adjustments*

To facilitate personalized, customized exchange, parties need to be able to adjust their offers dynamically. Auctions, which have existed for centuries, are the traditional market solution for creating dynamic offers. A series of electronic solutions – supporting either bargaining or auctions — has evolved to enable this type of market.

In contrast with the “posted price” web sites, an auction has no fixed posted offer (other than the reserve price). Sites that support dynamic offer adjustments can be divided into four main categories, discussed below. The present invention resides in one of the four spaces identified in the typology below - one buyer, many sellers (category number 4).

**Table 2: Markets With Dynamic Offer Adjustments**

	One Seller	Many Sellers
One Buyer	<b>1. Negotiation</b>  classified ads	<b>4. Buyer’s Auction</b>  <i>includes the present invention</i>
Many Buyers	<b>2. Seller’s Auction</b>  e.g., traditional Yankee and Dutch auctions	<b>3. Exchange Auction</b>  e.g., stock & commodity trading

## 1. Negotiation (one buyer, one seller)

This type of market is a negotiation, not an auction. They can be two party or multilateral (e.g. parallel one-on-one negotiations). It is included here for completeness.

5 Negotiations do not address market intelligence, search, seller execution or integration costs at all. Negotiations just adjust the elements of an ask/bid. However, as noted previously, the bargaining costs in a negotiation between a buyer and a seller are high because the parties have incentives to misrepresent their true preferences in an attempt to get a better deal. In contrast, in a buyer's auction with  
10 near perfect information, the buyer has a strong incentive to reveal her desires accurately and the sellers are motivated to fulfill those desires as completely as possible in a cost-effective way.

### a) *MIT Media Lab - AMEC - Frictionless – Tête-à-Tête*

MIT Media Lab's Agent-Mediated Electronic Commerce project (AMEC) has  
15 produced a collection of companies, projects and research papers, mostly focused on collaborative filtering (Firefly), multi-dimensional evaluation and recommendation engines (Frictionless, Tête-à-Tête) and autonomous bots (AMEC). The latter involves autonomous software agents, "bots," that are focused on one-one-one negotiations with and without their owner's intervention. The academic question is  
20 whether such bots can be trusted and manipulated (corrupted) and whether their negotiations produce optimal results for both buyers and sellers.

In the Kasbah system (Robert Guttman, Pattie Maes et al. at MIT Media Lab), non-mobile software agents negotiate over price, conceding over time. The user is allowed to choose between three concession rates, but there is no justification why a  
25 rational agent would use those particular strategies.

In the Tête-à-Tête system (Robert Guttman, Pattie Maes et al. at MIT Media Lab; being commercialized by Frictionless Commerce), each user can specify



preferences and a matching engine tries to satisfy both parties. Each user's utility function is assumed to have a particular parameterized form, and the user gets to adjust the parameters. The authors claim that the system does product brokering, merchant brokering, and negotiation, but Tête-à-Tête does not address the market intelligence, seller execution, or integration aspects of the overall problem.

The present invention is not concerned with autonomous negotiating bots and therefore the MIT-related work is interesting but not directly relevant.

## **2. Seller's auction (many buyers, one seller)**

Physical seller's auctions are familiar – many people have seen or participated in a Yankee auction, whether at the county fair or at an art gallery. Their electronic counterparts have emerged as a successful form of e-commerce.

There are hundreds of seller's auction sites operating on the web today. The reason for their success is that they take advantage of the virtual nature of markets on the web. Auctions dispense with fixed prices - and both buyers and sellers seem to like it. Sellers find it easy to set up seller's auctions for new goods, remainders, used goods and services. Buyers find it both convenient and entertaining to engage in a bidding contest for goods and services. For every buyer suffering from winner's curse (overvaluing a product), there is a success story of someone winning an incredible bargain.

Just as buyer's auctions can reduce transaction costs when buyer wants are unique and sellers can adapt to those, seller's auctions can reduce transaction costs when the items being sold are fixed in character and buyers need to investigate and evaluate each item separately. As discussed below, however, seller's auctions generally do not minimize the transaction costs described above.

a) *eBay and related examples*

There are numerous variants to the seller's auction, each with its own set of auction rules. These auctions include, without limitation, a Yankee auction, a silent auction, a sealed bid auction, and a Dutch auction. The most common type of multiple buyer-one seller auction is the Yankee auction, in which buyers compete with other buyers by increasing their bid prices, all the buyers get to see each other's bids, and the highest bidder gets the good or service being offered by the seller. Web sites that currently use a Yankee auction include eBay, Onsale, and Bid.com.

Although these auction sites do enable real-time adjustment of prices, they do little to alleviate the central problem of reducing the buyer's transaction costs. A buyer must still go through the tedious, time-consuming process of finding auctions that have a particular product or service that the buyer may want. The buyer must then compare the product or service attributes (other than price) being offered at each auction site to decide which product or service at which site she should bid on. If several products appear satisfactory, the buyer must either limit herself to bidding on a single one, hoping that the price will be acceptable, or must track several auctions simultaneously to bid in each. In an active auction for a single item, most bidders have their bids rejected and are left to continue their search, adding to buyer search costs. Even the "winner" may end up buying a product or service at one site when another site had a different product or service that the buyer would have preferred at its closing price.

In addition, the only aspect of the transaction that is adjusted in these auctions is the price - all other terms are fixed. Thus, the buyer and seller may end up exchanging the product or service on sub-optimal terms.

Moreover, many buyers would find it too costly to participate effectively in a seller's auction, because effective participation requires accurate information about what the item should cost, which in turn depends on detailed knowledge of the whole product category. For example, an auction of a stereo may require not only that the

buyer be familiar with the characteristics of the brand being offered but also how those characteristics compare to other available brands and what those other brands cost. Such buyers would not want to compete with other buyers for a particular good or service. Instead, these buyers would prefer to simply send out a request for an offer and then let the sellers compete with each other for the buyer's business. Similarly, seller's auctions do not meet the needs of sellers who want to be able to adjust their terms to create the most attractive package for the particular set of potential buyers in the auction.

***b) Mercata, Accompany***

The definition of "buyer" is changing because of the web. In the past, a buyer has been assumed to be either a person or a company. More recently, a buyer could be construed as a software agent (a bot). Also recently, the web has enabled the ability to create buying groups that act as a single entity. The groups combine their purchasing power and can thus cause sellers to lower their prices. Mercata and Accompany are buying groups with dynamic price adjustment. These systems share few characteristics with the present invention and have a number of limitations and shortcomings in providing a solution to the problems described above. These systems do not address market intelligence, search, or integration costs at all. Moreover, the systems are not necessarily auctions - it is possible for a seller to simply post an offer with a downward-adjusting price as more buyers sign on. In some ways, this is an automated form of a Dutch Auction. The systems adjust only price, not other terms. They do not offer a recommendation or evaluation (largely because it is a single-product auction, not one with choice). They, by definition, do not operate in real time - the auction is held open waiting for additional buyers to sign on and thus reduce the price for everyone.

**3. Exchange auctions (many buyers, many sellers)**

Electronic stock and commodity exchanges are auctions with multiple buyers posting binding "bid" prices and multiple sellers posting binding "ask" prices. The

most well known exchange of this type is NASDAQ. Access to NASDAQ is achieved via a number of successful on-line trading sites, e.g., Schwab, e\*trade, DLJ and Ameritrade.

5 In exchange markets, buyers compete with each other to meet their “bids” and sellers compete with each other to secure their “asks.” A buyer at one moment might become a seller at the next moment. This market has real-time adjustment of prices, with both buyers and sellers having near-perfect information about all prices and quantities.

10 These auctions also have important limitations. An inherent feature of their design is that the only aspects of the transaction that can be adjusted are quantity and price – all other terms are fixed. This may suffice for commodity goods and financial securities, but it can result in sub-optimal transactions for more complex goods and services. Moreover, because all the goods exchanged in the auction have the same price, these auctions cannot be used to sell non-identical goods.  
15 Consequently, they do not reduce the search costs of a consumer who wishes to compare these goods against similar but not identical goods.

Moreover, for the reasons noted above, many buyers do not want to compete with other buyers for a particular good or service. Instead, they want to simply send out a request for an offer and then let the sellers compete with each other for the  
20 buyer’s business. Similarly, many sellers do not want to compete with each other in the presence of multiple buyers, but would prefer to tailor their offer to a single buyer whose multi-dimensional needs are explicitly understood by the sellers.

#### **4. Buyer’s auction (one buyer, many sellers)**

25 The buyer’s auction is the space in which the present invention resides. The Internet has enabled so-called “buyer’s auctions” to be practical for a far wider range of goods and services than was previously possible. In these auctions, the buyer is the center of attention, with multiple sellers vying with each other for the buyer’s

business. Many of the existing buyer's auctions reduce the cost of transacting some types of business, but most do not eliminate or reduce the five transaction costs discussed previously.

5 There are several current examples of buyer's auctions that illuminate the limitations of today's approach and the new role for the present invention. Each example is described briefly below and important features are identified that distinguish it from the present invention. All of the current buyer's auctions are flawed in one or more significant respects, which prevents them from being full solutions to the problems described above. Moreover, none of the current buyer's auctions teaches or suggests the business methodology (revenue model) of the present invention for gathering and selling the marketing information generated by a buyer's auction with near perfect information.

It will be demonstrated in the next section that the present invention is a pure buyer's auction, differentiated from all previous attempts at creating such a market.

#### 15 a) *FreeMarkets*

FreeMarkets conducts business-to-business auctions that enable large buying organizations to purchase industrial materials and components. The FreeMarkets process is similar in most respects to the traditional RFQ process described above, with the exception that all bidding takes place online.

20 The FreeMarkets process is time- and labor-intensive. A team of FreeMarkets employees is assigned to each project. The team spends weeks working with the buyer to develop a comprehensive RFQ with detailed technical, commercial, logistical, and quality specifications of the supplies to be purchased, so that only price adjustments can be made during the auction itself. The RFQ is distributed a few days to several weeks prior to the auction. Only pre-screened suppliers invited by the buyer can participate. As previously observed, this is itself a signal that the transaction costs of the auction are quite high.

During the auction, which takes place online, sellers can place bids for “lots” of supplies that they want to sell to the buyer. “Lots” are parts or line items that have been grouped together by the buyer. The sellers cannot place bids to sell individual parts or line items to the buyer. At the same time, the buyer is committed to  
5 awarding all line items within a lot together. Moreover, the buyer must commit to making an award to at least one seller at the beginning of the FreeMarkets process. The sellers remain anonymous to other sellers during the auction, but they can see the evolving market price for a lot, and they can respond with new bids. The only variable in the auction is the lot price. All other variables are fixed by the RFQ. A  
10 typical bidding session lasts two to four hours.

After the auction, sellers with competitive bids must go through further qualification steps, including submitting cost breakdowns to the buyer and supporting on-site visits by the buyer. Thus, the buyer can only consider non-price factors outside the auction itself.

FreeMarkets is a buyer’s auction; however, the FreeMarkets solution differs significantly from the present invention and has several limitations and shortcomings in providing a solution to the problems described above. It has high transaction costs – both time and labor – before, during, and after the auction, which would be  
15 intolerable in many business-to-business, business-to-consumer, and individual-to-individual transactions. The buyer must approve the sellers beforehand, which is time consuming and can result in the buyer excluding a seller who unbeknownst to the buyer could have provided the best offer. The auction itself takes several hours and there are several additional time-consuming steps that the seller must go through prior to completing the transaction (e.g., hosting site visits by the buyer).  
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The only variable that changes during the auction is the price. Also, the buyer cannot change her mind and withdraw the RFP – the buyer is contractually committed to buy from at least one of the sellers from the outset as an inducement for sellers to expend the resources necessary to enter a proposal. These features are,  
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as previously observed, indications of the high costs of the bidding process. These features also make the process inappropriate for inexperienced consumers who may want to see an offer before deciding whether or what to buy. In terms of the five costs discussed above, the process entails significant costs for the buyer in every category.

The sellers are also burdened with imperfect information. Although they do see the lowest price offered for a lot, they do not know the identities of the competing sellers. This lack of knowledge may lead a seller to make a sub-optimal bid. For example, a seller with an excellent reputation for service and support may erroneously decide to match the low bid of a competing seller with a poor reputation, thereby giving up the premium that he could have captured for himself because of his superior reputation (i.e., brand power). Moreover, the buyer can only consider important factors other than price outside the auction itself – for example, vendor-supplied financing, warranty, and all the other terms and conditions associated with complex purchases.

#### *b) Orb|Bid*

Orbbid.com is a web site that describes an RFP/RFQ concept that focuses on multidimensional RFPs and RFQs, facilitates multidimensional offers by human sellers and includes recommendations and evaluations using human experts.

Orb|Bid can conceptually operate as a buyer's auction; however, the Orb|Bid process differs significantly from the present invention and has numerous limitations and shortcomings in providing a solution to the problems described above. It does not address the buyer's market intelligence costs at all. As in a traditional RFP process, the buyer has to educate herself. Search costs also remain high. The Orb|Bid process does not automatically search for potential sellers. Instead, just like a traditional RFP, the buyer spends time and money to pre-qualify sellers or, alternatively, the buyer merely posts the RFP on her own web site and hopes that potential sellers come to her site and find it. Bargaining costs are higher in Orb|Bid

than in the present invention's fully automated buyer's auction because of the high costs of human intervention in the Orb|Bid process. Seller offers are adjusted manually in Orb|Bid during the auction. Similarly, offers are evaluated by human experts during the auction. In addition to increasing the transaction costs, the intervention of human experts limits the practical size of the auction and means that the auction has to be scheduled in advance when the relevant experts are available. As with FreeMarkets, a system designed for industrial (large-scale, high-value, complex) RFPs and RFQs differs significantly from a system geared more towards consumer-oriented products and services.

c) *Priceline*

U.S. Patent No. 5,794,207 describes a type of one buyer-multiple sellers process used by Priceline.com. In the Priceline process, the buyer submits a purchase offer coupled with a payment guarantee (e.g., a credit card account number) to an electronic intermediary. The buyer's offer is then communicated to a plurality of sellers. The first seller to accept the offer forms a binding contract with the buyer, thereby ending the process. Note that the Priceline process is not an auction in traditional economic terms because one requirement for an auction is a comparison of offers, with inferior offers rejected in favor of superior offers.

The Priceline approach has numerous limitations and shortcomings in providing a solution to the problems described above. Market intelligence and integration costs are not addressed at all. Moreover, there is no auction adjustment of sellers' offers. Indeed, from the buyer's point of view, there are no seller offers at all — just acceptance or rejection of the buyer's offer. From the seller's point of view, the auction is not iterative: it makes a single decision to accept or reject a proposed price (although seller counteroffers are possible). Plainly, bargaining costs are not reduced at all in this mechanism because there is no comparison of sellers' bids.

Priceline makes no attempt to create near-perfect information between buyers and sellers. The sellers do not have any information about competing sellers because





tickets directly from the airline. Instead, she lists the reservation with Travelbids. Travel agents then bid to sell the tickets to the buyer in a buyer's auction. The travel agents can see the bid amounts during the auction (but not the bidders' identities). The travel agent bidding the highest rebate (discount) of his commission takes over the reservation, charges the buyer's credit card, and sends the tickets to the buyer. The buyer must accept the winning bid.

Although Regular Listing auctions are beneficial to the narrow market niche that they serve, they have numerous limitations and shortcomings in providing a solution to the problems described above. Market intelligence, search and integration costs are not addressed at all. The buyer has to do all this work herself (which is one reason why travel agents are willing to rebate some of their commission to her). Moreover, the only variable that can be adjusted during the auction is the discount price. All other terms are fixed.

For Travelbids' "Full Service Listings," the buyer lists her specifications for the proposed trip, and a maximum of three travel agents can e-mail their proposals to the buyer. The buyer is not obligated to buy any of the three proposed trips.

Like Regular Listing auctions, Full Service Listing auctions have numerous limitations and shortcomings in providing a solution to the problems described above. Market intelligence and integration costs are not addressed. Sellers are blind to each others' offers, the number of sellers is limited to three, and there is no iteration in the bidding. Thus, bargaining costs are not reduced as much as they would be if sellers had complete information about each other's bids, if more than three sellers were allowed to bid, and if sellers could adjust their initial offers.

#### IV. The Solution: A Buyer's Auction with Near Perfect Information

The present invention is focused on solving the problems and limitations discussed above. From an architectural perspective, the invention is referred to as a

“system,” whereas from a service perspective it is referred to as an “Auctioneer.”

The detailed methodology for accomplishing these tasks is described below (see the Detailed Description of the Invention), but its primary attributes include the following:

5           a)    The system implements a buyer’s auction that is fundamentally designed to minimize market intelligence, search, bargaining and transaction execution costs and thus create more competitive, frictionless markets.

          b)    Buyers and sellers can efficiently conduct the buyer’s auction within the Auctioneer’s unified environment, thus minimizing buyer integration costs.

10           c)    The buyer’s auction generates valuable proprietary information for both buyers and sellers and a revenue stream (hence a robust business model) for the Auctioneer offering such a service.

**A.     *Nine Key Discriminators***

          The present invention can be described in terms of nine attributes that, in various combinations, distinguish it from the prior art.

**1.     The buyer requests the offer.**

          The buyer initiates the process by requesting an offer. In a preferred embodiment, participation in the auction can be free for both buyers and sellers. This encourages the maximum number of buyers and sellers to participate, thereby  
20           creating the greatest numbers of RFOs and actual offers.

          One object of the present invention is to perfect markets for consumer goods and services. The products and/or services that consumers want to buy vary over time, with many items (particularly durables) purchased only infrequently. Sellers of these goods and services, however, tend to have a lasting presence in the market that does  
25           not vary greatly from day to day, which makes it relatively inexpensive for sellers to

set up sites to present their goods and services and to use seller bots to negotiate with potential buyers. Thus, transaction costs for ordinary consumer transactions are lowest when the sellers are the ones who maintain stores or websites and make the initial offers to buyers in response to the buyer's stated criteria.

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**2. There is an auction adjustment of sellers' offers.**

Because different buyers have different priorities and preferences, the sellers' offers in a perfect market need to respect that and be tailored to the particular buyer. To economize on market intelligence, sellers also need to be made aware of existing competition before proceeding. Without auction-style adjustment, offers could not be tailored so accurately to the buyer's individual preferences and to the competitive situation.

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**3. The auction process is fully automated.**

The auction process is fully automated, including buyer's rules and sellers' rules. This design rule is important because employing software processes (bots) to conduct at least a portion of the auction reduces some of the transaction costs, including time costs. Without this feature, limiting auction costs would require employing the kinds of the cost limiting devices used in traditional auctions, such as forcing buyers to commit, pre-qualifying sellers, limiting the number of rounds, and so on.

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In mass market oriented systems, any human intervention imposes labor costs that can easily make the business model infeasible. Hence, the system has to be designed from the ground up without human intervention by sellers and minimum human intervention by buyers. On the other hand, people today do not trust automated processes (bots) to perform decisions for them. Buyers, for example, are unwilling to delegate the bargaining tasks to a bot. The single exception found in consumer markets is programmed trading. The present invention is designed to

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support the critical aspects of the buyer's auction that are appropriate for automation, including market intelligence, search and sellers' adjusted offers.

**4. The offer adjustment can be iterative.**

5 The auction can be set to have one or multiple rounds with adjustment for length of time. However, in the preferred implementation, an open-ended iterative procedure is used in which bidders must improve their offers at each round or cease bidding.

10 The reason for using an open-ended procedure is that efficient outcomes are reliably achieved only in markets in which the parties have an opportunity to make offers that overturn any inefficient outcome. That happens most reliably in an iterative process, in which sellers learn about the best standing bid and have an opportunity to respond. (There are also auction designs, such as the Vickrey auction, that mimic the outcome of an iterative process in a single stage process. The iterative adjustment is therefore not a necessary feature of the process.)

15 **5. Both price and other decision factors may be adjusted in the bidding.**

The request for offers (buyer's RFO) and answers (sellers' adjusted offers) are matched in multiple dimensions, agreed upon in advance via an electronic template so as to minimize market intelligence, search and bargaining costs. If a seller were  
20 limited to adjusting his price, the opportunity to tailor the deal to the customer would be lost and the problem of bargaining costs would not be overcome.

**6. There is near-perfect information available to both buyers and sellers.**

25 In a preferred embodiment, the buyer sees all the sellers' offers and the sellers see both information about the buyer preferences and all the information about each others' offers. Without near-perfect information, all the anomalies and sub-optimal

results seen in the physical world would reappear in the virtual world. (As used herein, the terms buyer and seller respectively include buyer's bots and seller's bots.)

*Near-perfect information* requires, among other things, enough information for the buyers and sellers to tailor their deal optimally and for sellers to respond to their competitors' offers. Without these two characteristics, either bargaining costs or competitive intelligence costs would prevent efficient outcomes.

#### **7. The buyer can withdraw.**

The buyer's ability to withdraw its RFO allows the inexperienced buyer an opportunity to experiment, learn, and refine the description of her preferences. This permits more effective search and bargaining and affords the buyer an opportunity to discover whether there is anything being offered that meets her needs. Without the right to withdraw, the buyer might be too fearful of making mistakes in a multi-attribute search to be willing to participate in the process.

#### **8. The auction can operate in real time.**

The process operates on-line and in real time. The time required to create and clear the market is a resource, and using it entails a significant cost. Minimizing time and effort by both buyers and sellers reduces total cost for everyone.

Real-time operation can help to drive buyer search and bargaining costs close to zero. If the auction is slow, the need to conduct repeated auctions with different criteria could discourage the buyer, leading her to give up on searching for a better deal or trying to express her preferences more precisely before gathering full information.

9.      **The system provides a recommendation to buyers and bid-relevant information to sellers.**

5      Buyers receive recommendations about the desired product or service. The recommendation is based on a complete evaluation of all dimensions of all offers measured against the buyer's stated and/or previously archived criteria. Sellers can receive information about the how winning bidders adjust their offers based on the buyer's stated preferences, utility function and profile.

10     This mechanism helps to create the conditions of near-perfect information. Without it, the buyer would be faced with an overwhelming set of offers to assess and sellers would be left to guess about what buyers wanted.

***B.      A system to minimize total transaction costs***

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## 1. Minimize market intelligence cost

### a) *Buyer expresses initial “I want to buy” and decision criteria*

5 The system preferably offers the buyer a natural language inquiry to express the initial “I want to buy . . . .”

The system preferably offers the buyer expert assistance on refining and structuring the desired product/service in the form of an electronic decision criteria template.

10 The system preferably supports the buyer’s need to iterate on the template, trying out various formulations, until the buyer is satisfied that she understands the relevant factors of a decision.

### b) *Buyer sets personal priorities*

The system preferably offers the buyer expert assistance in defining personal goals and tradeoffs in the form of a priorities template.

15 At the buyer’s option, the system can provide a variety of automated assistance to help the buyer set her priorities, e.g., archival knowledge of what the buyer has opted for before, of the buyer’s peer group goals; and of third party experts’ opinions on priorities.

### c) *Sellers can be informed about buyers.*

20 Sellers can receive various types of information about a particular buyer before, during, or after a buyer’s auction with that buyer, if the buyer permits. In addition, sellers can receive statistical information from the buyers’ “I wants” to help them assess what product offerings would be most desired by their customers and what kinds of bids have been winning customers. This data mine is current and can take



into account all the proprietary information resulting from previous buyer's auctions that occurred within the system.

*d) Sellers can be informed about current competitors.*

5 Before bidding for a particular customer, sellers can receive the same search results as were available to the buyer, providing them with valuable information about the current state of competition in the market.

**2. Minimize search cost**

*a) Buyer and sellers can see all competitive posted offers*

10 The system applies the buyer's decision criteria and priorities template against a database of instantaneous market choices (posted offers). In contrast to systems that sell position in a list or that have a small and exclusive set of sellers, this system can prioritize sellers using the buyer's own criteria.

15 The system provides a rich set of constraints that can be set by the buyer (or set via defaults) to delimit searches, e.g., by geography, by various characteristics of the product; or by characteristics of the seller.

The system can select a subset of the market choices and presents them to both the buyer and sellers in a directly comparable format.

*b) Buyer receives an evaluation and recommendation*

20 The system offers the buyer an evaluation and recommendation on the best match between the buyer's decision criteria and priorities compared to the posted market offers. This feature helps the buyer sift through the many offers to identify the ones that are most promising according to her specified criteria.

The system supports the buyer's possible need to iterate on her features template and priorities after she has seen the market choices. This iteration refines and

solidifies the buyer's demand and moves her closer to a buying decision. Of course, a buyer can also choose to skip seeing the posted offers and go directly to the buyer's auction.

*c) Sellers have relevant customers identified to them.*

5 Sellers do not need to incur substantial advertising costs to find customers. Merely by providing a good deal to their target customers on their website, the relevant buyers will be identified to them, allowing them to make an offer for free. The same information is scattered throughout the web (and is therefore non-proprietary), but the system reduces the cost to the seller by providing it at the right  
10 time in the right form, i.e., precisely at the moment when a motivated buyer emerges and about the exact product or services that are relevant.

**3. Minimize bargaining cost**

*a) Buyer requests an offer - "make me an offer"*

The system creates a personalized auction for buyers. The system presents  
15 bidding sellers (i.e., their automated proxies operating within the system's servers) with the buyer's statement of demand (i.e., request for offer) and product feature decision criteria. In addition, if the buyer permits it, the system can provide sellers with the buyer's personal priorities template, archival data and profile.

*b) Seller sets business rules*

20 The system presents bidding sellers with a business rule format containing variables that map onto the buyer's priorities (e.g., total cost and quality) with the goal of capturing the demand.

The system supports seller business rules that are either set within the system or are set on the sellers' servers (proprietary to the seller).

c) *System automatically presents adjusted offers to buyer and bidding sellers*

5 The system simultaneously presents to bidding sellers near-perfect information regarding the buyer's priorities, profiles, and all other competitors' posted offers compared to the sellers' posted offer.

The system adjusts bidding sellers' posted offers by applying sellers' business rules.

The system simultaneously presents the result of a request for adjusted offers to buyers and to all other bidding sellers.

10 The system can present the buyer with an evaluation and recommendation on best matches between a buyer's decision criteria and priorities as compared to sellers' offers. Evaluations and recommendations can be given before, during, or after the auction process. Sellers can receive analogous information.

15 The system can present to bidding sellers an analysis of the transaction that helps to explain why the winner captured the demand and/or why a seller lost.

d) *Auctioneer can automatically attach complementary offers to the buyer*

20 The system (representing the Auctioneer) can present complementary offers that are related to and increase the value of the offer in response to the buyer's request for offer. The offers made by the Auctioneer (i.e., the service) can increase the value of one of the criteria in the electronic template defining the characteristics of the product, e.g., product features or upgrades; or can increase the value of one of the criteria concerning buyer preferences, e.g., better financing, warranty or delivery terms. The auctioneer can attach such complementary offers by purchasing these  
25 ancillary benefits from a third party or by making an arrangement with a third party

to attach their services to the adjusted offer. In this manner, the buyer is assured that using the service can always result in a benefit.

**4. Minimize seller execution cost**

**a) *The system archives auction data.***

5 The system captures all relevant data resulting from all phases of the auction, including data about why a purchase was not made. This minimizes the buyer's and sellers' need to exchange data, even when the buyer is dealing with a new seller for the first time.

**b) *The system can deliver a complete order to seller and confirmation to buyer.***

10 The system stores all relevant information necessary to create a purchase, transfer funds and effect delivery. This can reduce or eliminate the need for additional communication between the buyer and seller after the auction to consummate the transaction.

**c) *The system can collect funds from the buyer and transfer them to the seller.***

15 The system provides a modern, secure and efficient transactional environment. This provides assurances of delivery to the buyer and collection to the seller, while also streamlining the process.

**d) *All buyer's data, sellers' data and outcome of the buyer's auction can be archived and integrated as inputs to the next RFO cycle.***

20 The system captures all the data about an auction. A multi-round, iterative procedure can become burdensome if information is not intelligently archived and  
25 integrated. The system can perform these functions.

## 5. Minimize buyer integration costs

The entire experience - from first identification of a need, to search, to bargaining, to transaction, to post-sale service - can be considered as an integrated flow. This integration presents a major opportunity to minimize the total cost to both buyers and sellers. Even if each of the individual stages in the pipeline described above were available elsewhere, the total cost of doing them separately will always be higher than the cost of doing them in a unified fashion.

### a) *Step-by-step content for buyers*

The system can provide the buyer with all the information and ancillary support services needed to complete successfully the entire process – from first identification of a want through execution of a purchase transaction.

### b) *Consistent user interface for buyers*

The system maintains a consistent user interface for the buyer throughout all stages of the process (market intelligence, search, bargaining and transaction execution).

### c) *Integration of third party content*

The system integrates within a common interface a rich variety of diverse, heterogeneous, third party content to provide market intelligence for the buyer while maintaining a consistent environment. This extensible framework enables the system to add new templates as they become available from third parties.

### d) *Templates for communication between seller and buyer*

The system arranges for low cost communication between the buyers and sellers by providing common templates, e.g., for expressing feature priorities and optimizing goals. This has two effects - it reduces the amount of time needed by buyers and sellers to enter data; and it provides a protocol that makes the

communication between buyers and sellers and the computation about the offer both relevant and efficient.

*e) Automatic archiving*

5 The system leverages its institutional memory (archives) about all buyers and all auctions - who won, who lost and why - to the benefit of both buyers and sellers. In most systems, the need to enter data is a major inhibitor to use. This system captures data on the fly wherever possible and can reuse it both for specific (individual buyer or seller) and aggregate (large-number auction analysis) purposes, provided that user privacy concerns are addressed.

10 *f) In-situ transaction*

The system enables the buyer to accept an adjusted offer and consummate the transaction within the Auctioneer's site. This removes from the buyer the integration cost of interacting with a third party system (i.e., the successful seller), e.g., re-registering, learning to navigate a new environment, and re-entering data that have already been entered elsewhere before.

15 *g) Post-sale service*

20 The system supports near-automated post-sale service by maintaining a complete archive of the transaction. The archives are maintained for each buyer, each seller and each auction. In the event that post-sale service is required, all the data about that transaction are available in archived form. The archiving is fully automated. Hence, the creation of these archives requires no additional effort by the buyer or the seller. Moreover, the system ensures that the privacy concerns of the parties are met.

**C. The system is supported by a robust business model**

**1. Goal - maximize participation and information revelation**

The system business model is designed to encourage maximum participation by both buyers and sellers by keeping costs low for both sides of the market. For buyers, the system is without charge and easy to use. For sellers, no charges are levied that don't have offsetting benefits. For sellers, the most basic level of participation (submitting posted offers) costs nothing, thus removing all price barriers. There is no reason not to participate merely because many other sellers are participating.

At the same time, because low seller costs promote wide seller participation in the auction, the buyer's incentive to conceal her preferences is usually eliminated. Competition among the sellers using the buyer's stated preferences makes it difficult or impossible to exploit the buyer's preferences as could happen in a bargaining or negotiation situation. Thus, the multidimensional auction itself solves one of the key information problems.

**2. Products and Pricing**

The system creates value as an infomediary by delivering two kinds of products to sellers: a *market information product* and an *Auctioneer success fee product*. The pricing structure should be set so that it remains robust as the business grows and the products should be reliable and difficult to redistribute in ways that preserve their value.

**a) Information products (for sellers)**

The system solves the problem of an apparent market failure for information by producing timely and relevant information for both buyers and sellers. Buyers receive all market and archival information at zero cost. Sellers can subscribe to a

variety of information packages that can be bundled and price discriminated according to their perceived value. A simple example is two bundles of information:

### **(1) Non-proprietary information bundle**

5 The non-proprietary bundle theoretically should include all information that sellers could extract from the web with some effort, i.e., it is either posted publicly or can be purchased by a subscription from third parties. For example, sellers can replicate the functionality of extracting instantaneous comparisons of their products with all other competitive products then-posted on the web by using a sophisticated search engine, e.g., the Inktomi Shopping Engine. Also, sellers can purchase profile  
10 information from third party sources, e.g., Acxiom. However, a byproduct of the system is a clean, relevant and timely compilation of those data. Those data are valuable and support the revenue model.

### **(2) Proprietary information bundle**

15 The proprietary bundle theoretically should include all information that sellers cannot extract from the web with effort, i.e., it is neither posted publicly nor can it be purchased by a subscription from third parties. For example, sellers cannot replicate the functionality of the auction, hence sellers cannot see: (i) who bid, (ii) what elements of the offer they adjusted, (iii) who won the round, and (iv) why they won the round. However, a byproduct of the system is a clean, relevant and timely  
20 compilation of these proprietary data.

Because the proprietary data are produced as a byproduct of the buyer's auction, neither buyers nor sellers are required to expend additional effort (cost) to generate this information. Yet this information is extremely valuable to both buyers and sellers. The difference between its production cost (near zero) and its market value  
25 (high) represents the potential profit margin that can be extracted by a service using this invention.



Importantly, the data generated within the system is most valuable when used immediately. That is, the information is useful for making a sale to this customer who is requesting an offer right now. By running the sellers' bidding-offer bot internally on the system, no information leaks from the system during the period when that information is most useful. Because the information does become available later, its accuracy is subject to verification, but not before its usefulness to the seller has diminished.

Logically, the data that are exclusively available via the system as a direct result of the buyer's auction are valuable and provide support for the revenue model. The system reallocates the value gained by making a transaction more efficient into a proprietary information product. The price of that product to sellers can always be set to be less than its value. Thus, the reallocated benefits of a buyer's auction accrue in three directions: to the buyer (by producing a zero-cost optimal result in response to an "I want"); to the seller (by producing low cost proprietary information that can be leveraged across all transactions); and to the system (by producing a robust and sustainable revenue stream for the infomediary).

*b) Auctioneer success fee product*

From the seller's point of view, the second product is the role of the system as Auctioneer and the opportunity to participate in the buyer's auction. The business model for traditional (Yankee) auctions is well-established on the web. Companies such as eBay extract between 2.5% and 7% of the value of a completed transaction. Because these are "success fees", they logically do not inhibit sellers from becoming active bidders. And because the auction is fully automated, other costs of participating are also low enough not to discourage participation. As with all success fees, only the winner pays. Everyone else has a free ride. The purpose of the information products (above) is to more fairly allocate the cost of running the system between all sellers.

5

When compared to other auctions that charge an identical transaction success fee, this system produces greater value for sellers. The reason is that most auctions (or posted price sales) randomly perform a best match between buyer's demand (utility function) and sellers' offers (production function). This system is optimized to perform the best match. The difference between the optimized approach must produce equal or greater value for sellers versus the random approach. Hence, even when comparing two systems with identical success fees, this system will be more beneficial to sellers.

### 3. Revenue sources eliminated from the business model

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An important goal of a buyer's auction is to encourage as many buyers and sellers as possible to participate. Markets work best when the most people play in a competitive environment with near-perfect information. Anything that unfairly discourages buyers and/or sellers from participating should be eliminated.

15

Note that the core revenue model specifically excludes several types of revenue so as not to create disincentives and resistance for either buyers or sellers. The presence of these revenue sources could discourage buyers and/or limit the number of sellers.

20

"Pay to play" fees are a small entry fee, as in the "ante up" in a card game. These fees are eliminated because they discourage the bidders who lose repeatedly (small market share) at the expense of larger sellers. Discouraging such bidders would prevent the number of sellers from growing as the business grows.

25

Two other sources of revenue are eliminated because they would likely undermine buyer confidence in the objectivity of the system's recommendations. One such source is banner advertising fees, which may both raise buyer suspicions and skew the auction in favor of larger sellers who are able to advertise heavily. This is the same principle as barring campaign advertising next to a polling booth during an election.

Position placement fees are eliminated because they unfairly skew the results of the auction in favor of larger sellers who can purchase a position even though their total score was not the highest. Also, they throw the credibility of the system into doubt in the buyer's mind, thus inhibiting buying.

5

## V. Application Scenarios - Commerce Themes

The mechanism of a buyer's auction has wide applicability. The present invention can be applied to many situations including goods and services, from low end to high end. The particular framing of the "I want to . . ." illustrates the range of applications. In some cases, goods and services are bundled together, e.g., a contractor building a house; an auto mechanic repairing a transmission.

"I want to . . ." examples include, without limitation, the following goods and services:

### A. Health

	<b>goods</b>	<b>services</b>
<b>high end</b>	intensive home care equipment e.g., monitoring instruments  uninsured prescription drugs	non-elective surgical procedure that needs to be reserved quickly, e.g., heart bypass, ovarian cancer  health insurance
<b>low end</b>	insured prescriptions drugs  drug store SKUs	minor elective clinical procedure, e.g., dental hygiene  coupons for personal hygiene services

Goods:

“I want to rent a convalescing bed for three months...”

“I have five prescriptions I need to fill every month. I want to get a price for the whole bundle from one company....”

“I want to do my drug store shopping list...”

Services:

“I want to find a surgical center that can schedule a \_\_\_\_\_ procedure immediately....”

“I want to find a better group health plan for our small business group...”

“I want to receive offers from physical therapy centers near my home - have a sports injury to my knee. Doctor prescription....”

## B. House & garden

	goods	services
high end	new house  living room furniture	install new roof  home insurance
low end	bed and kitchen goods  grocery, household supplies	garden maintenance  ISP  newspaper delivery

### Goods

"I want to buy living room furniture - must have great financing..."

"I want to get a mid-range refrigerator. Include installation and delivery...."

"I want to subscribe to five magazines, a book club and a DVD club..."

"I want to get coupons to the following list of items..."

### Services:

"I want to buy a house for lower commission than 6%..."

"I want to refinance my home..."

"I want to get an ISP that can host my family web page..."

"I want to get the best telephone rates..."

"I want to be find all department store sales the minute they start..."

“I want to join...”

### C. Personal finance

	goods	services
high end	computer and SW	mortgage, insurance brokerage account credit & debit cards
low end		tax return, CPA commercial bank services traveler's check, foreign currency

5

#### Goods

“I want to get a PC and printer and tax preparation software...”

#### Services:

“I want to refinance my home...”

“I want to I want to do online trading and get low commissions...”

10

“I want to get new home insurance including earthquake...”

“I want to get better rates and higher limits on my credit card...”

## D. Automobile

	goods	services
high end	car  major car parts, audio system	major collision repair  auto insurance  major mechanical repair
low end	replacement car parts, tires  gasoline	oil change

### Goods

"I want to buy a car..."

"I want to get an audio system for my truck..."

"I want to find a great deal on tires..."

"I want to get coupons for gasoline..."

### Services:

"I want to find a body shop to fix my car - insurance claim..."

"I want to find auto insurance for my 16 year old boy..."

"I want to get a complete transmission overhaul..."

"I want to get 60K maintenance done on my 1993 Ford Taurus..."

## E. Leisure, travel, entertainment & sports

	goods	services
<b>high end</b>	pleasure boat  new golf clubs	luxury cruise, all-inclusive resort  weekend getaway  theater, pro sports
<b>low end</b>	sports and camping equipment  luggage  sports clothing  CDs, books, videos, DDS	dance clubs  restaurants    movie

### Goods

5

“I want to buy a power boat...”

“I want to find a set of golf clubs...”

“I want a complete set of camping equipment for a family of four - tent, sleeping bags, cooking equipment...”

### Services:

10

“I want to book a cruise to Mexico including airfare and trip cancellation insurance...”

“I want to rent a car for a week in Florida...”



“I want to find a weekend getaway for two in Napa...”

“I want to go swing dancing tonight...”

“I want to find a French restaurant, reservation at 8:00 p.m. for four...”

5

**F. Small office, home office**

	<b>goods</b>	<b>services</b>
<b>high end</b>	business machines  office furniture	office rent  group health insurance plan  legal and accounting services
<b>low end</b>	office supplies	telecommunication, ISP  janitorial

Goods

“I want to buy five PCs for my company...”

10

“I want to get a [particular brand] office setup...”

“I want to find a supplier of [part brand] ink cartridges...”

Services:

“I want to rent an office, 2,000 sq ft, Palo Alto area...”

“I want to get a group health plan for five people...”

“I want to get bids for our telephone service...”

“I want to find a janitorial service, daily...”

5

### G. Brokers and agents

	goods	services
high end	--	agent to sell my house  art auction  agent to sell my car
low end	--	stock broker  insurance broker  consignment agent for furniture  travel agent

### Services:

10

“I want to sell my house and want bids on commission rates...”

“I want to sell my antique bed and want bids from antique dealers on consignment rates...”

“I want to trade on-line and want bids on commissions...”

“I want to buy air travel and want bids on commissions...”

5      **H.      Education**

	<b>goods</b>	<b>services</b>
<b>high end</b>	PC, printer	private college technical and vocational training
<b>low end</b>	books school supplies	college prep course self-help course

Goods

“I want to get all the school supplies for my five kids, one time...”

Services:

10      “I want to find a college that can give me a scholarship...”

“I want to learn Spanish...”

“I want to receive technical training on \_\_\_\_\_ (subject)...”

“I want an SAT prep course...”

“I want to get re-certified as a real estate agent in California...”

# I. Personal matters

	goods	services
high end	--	lawyer  accountant  private investigator
low end	--	employment counselor  tutor

## Services:

"I want to change jobs..."

"I want to track down my long-lost aunt..."

"I want to find a divorce lawyer that charges less than..."

"I want to find someone to do my taxes right away..."

"I want to find a masseur who knows how to..."

"I want to find someone to teach me how to..."

"I want to find an organization that..."

"I want to join a club that does..."

"I want to find a great yoga center..."

"I want to find a \_\_\_\_\_ (man, woman) for a casual relationship..."

**J. Electronics & computers**

	<b>goods</b>	<b>services</b>
<b>high end</b>	home theater  PC, printer, etc.	technical consultant  installation & repair
<b>low end</b>	portable tape player  batteries, cables, supplies	ISP

5

Goods

"I want to get the following supplies for my office, on a regular basis..."

Services:

"I want to get an expert to set me up with PCs, software and teach me how to use it..."

10

"I want to find someone to design, install and maintain a home theater..."

The various embodiments described above should be considered as merely illustrative of the present invention and not in limitation thereof. They are not intended to be exhaustive or to limit the invention to the forms disclosed. Those skilled in the art will readily appreciate that still other variations and modifications

may be practiced without departing from the general spirit of the invention set forth herein.

## **VI. Mitigating Potential Negative Effects: Auction Design Rules**

5           Every market has the potential to be distorted or corrupted. The present invention contemplates such negative influences. The auction rules are designed to minimize or completely eliminate undesirable side effects. In that sense, the invention encompasses methods and constraints on its own mechanism, much as the preferred embodiment of a jet engine might contain sensors, governors and fire  
10           extinguishing systems to keep it from causing damage.

          A primary method of mitigating the potential negative effects of this powerful market mechanism is embodied in the auction design rules. Those rules are an extensible framework that can be changed as potentially pernicious symptoms become apparent. For example:

### **A. *Collusion and price fixing***

15           When sellers behave competitively, perfect information helps to support perfect market outcomes. However, when sellers are seeking to collude, excessively good market intelligence can make collusion easier. The rules of the auction and the information products can be adjusted to make collusion and price-fixing more  
20           difficult. For example, in highly concentrated markets, it may be desirable to hide the identity of the bidders to limit the use of that information to enforce a collusive agreement. Adding such a feature has been contemplated and can be built into the auction design rule.

***B. Predatory pricing***

Similarly, bidders in an open auction could, in principle, use the information to prevent a particular competitor from obtaining any business, or any business that meets certain profitability criteria. Again, the auction rules can be designed to hide  
5 enough information to make such strategies difficult or impossible. Adding such a feature has been contemplated and can be built into the auction design rule.

***C. Price discrimination***

A potential concern about the distribution of so much information to bidders is that they will use it to engage in price discrimination. Indeed, we would expect that  
10 bidders might well bid aggressively for the consumers who are most likely to bring repeat business or to purchase profitable products. The result may well be lower prices for richer customers.

One solution to this problem is group-buying. The present invention can include group-buying features. Adding such a feature has been contemplated and can be  
15 built into the auction design rule.

In addition, the present invention gives buyers control over what information about themselves can be given to prospective sellers.

## SUMMARY OF THE INVENTION

The present invention is a methodology, system and business model for facilitating an online buyer's auction in which the major categories of transaction costs are significantly reduced by providing the buyer and the sellers with near-perfect information about one another.

The process is initiated by the buyer, who is assisted in creating a template that specifies her preferences to potential sellers. The buyer's request for an offer is based on a flexible "I want" that enables a fast, comprehensive search to be conducted to provide relevant feedback based on the buyer's preferences.

During the auction period, seller bots adjust the sellers' offers based on near perfect information about the buyer and the competition. This near perfect information can include detailed information about the buyer's current preferences, demographics, and previous buying history. In addition, it includes detailed information about competing sellers' offers. The offers are multidimensional, i.e. based on more than just price, which allows sellers to tailor their offers to the buyer. The use of seller bots enables fully automated submission of sellers' offers to the buyer in real time.

The system also provides an automated recommender to help the buyer identify the best offers according to the buyer's preferences.

The system provides the basis for an integrated solution to market intelligence, search, bargaining and transaction execution costs, thereby eliminating the integration costs of a piecemeal approach. In addition, the system provides the support for a revenue model for the sale of proprietary and non-proprietary marketing information derived from the auction.



## BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a block diagram illustrating the overall structure of the present invention.

FIG. 2 is a block diagram illustrating one embodiment of the core network.

5           FIGS. 3 - 22 are block diagrams illustrating exemplary embodiments of the individual components of the present invention.

FIG. 23 is a block diagram illustrating the communication of information between buyer interface and web server, and between seller interface and web server.

10           FIGS. 24 – 27 are flow charts illustrating an exemplary embodiment wherein the buyer creates a request for offer (RFO), specifies priorities, and receives adjusted offers.

FIG. 28 is a flow chart illustrating an exemplary embodiment of a buyer's auction.

15           FIGS. 29 – 30 are flow charts illustrating a process in which the seller specifies business rules, runs a simulation, and requests and obtains information generated by the present invention.

FIGS. 31 – 60 are diagrams illustrating exemplary computer displays seen by users of the present invention.

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## DETAILED DESCRIPTION

### 5 I. System Architecture

The architecture of a preferred embodiment of the invention is shown in block diagram form in Figures 1-22. The implementation of the architecture will be readily apparent to those skilled in the art because of the use of standard components and technologies, and need not be described in detail here because their use, functionality and interrelation will be readily apparent in the next section (System Operation).

Various aspects and features of the invention will now be described with respect to an exemplary embodiment of the invention as shown in Figures 1-22.

However, this embodiment is just one of many possible alternatives. There are a variety of ways in which one of ordinary skill in the art might architect the invention, including combining many servers and databases into a more condensed architecture to utilize less physical hardware. Tradeoffs of serviceability, service availability, scalability and other reasons could lead a designer of ordinary skill in the art to

architect the service in a different configuration than that described herein, without departing from the general spirit of the invention.

5 In addition, this technology could be implemented in whole or in part by third parties as a service, as an outsource service, as a desktop or server application or suite thereof, in a variety of manners that are well known to those of ordinary skill in the art and which need not be described further here.

10 Referring now to FIG. 1, TELEPHONE **A100** is a standard telephone attached to a telephone service (but could also be implemented as an IP based telephone, wireless telephone, satellite telephone, or other similar devices which generally include a speaker and a microphone).

15 In this embodiment TELEPHONY INTERFACE SERVER **A200** includes a telephone interface card (such as those from Dialogic or NMS) as well as central processing unit (CPU), memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers. This server provides access to the telephone system using T1 or analog lines, but could also provide access through voice over IP. The server typically has the capability to ring (place  
20 calls) as well as answer telephone lines. It can receive and capture electronically,

typically with .wav or similar file types, what the buyer is saying and either store this information, or send it to the SPEECH RECOGNITION SERVER A300 which can interpret the spoken material and compare it against a known grammar. Of course, A200 and A300 could easily be combined into a single physical server.

5

BUYER INTERFACE A400 is typically a standard computer, such as those which run the Microsoft Windows or Apple Macintosh operating systems, but could also be a network computer (a simple terminal with a small operating system), a screen based telephone, a WebTV box (or similar), a hand-held computer with remote communication capability, or other devices which could be used to interface with information on the World Wide Web of the Internet. Such devices may use a modem (line, cable, satellite, ADSL, wireless etc.) or network adapter to a Local Area Network connected to the Internet, to interface with information on the Internet. The BUYER INTERFACE A400 may use an Internet Service Provider to connect to the Internet, but may utilize other means as well. A buyer would typically utilize such a device in order to view and interact with web pages.

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INTERNET as referred to in the drawings includes a worldwide network of interconnections and routers connecting computers and databases worldwide, which is also typically accessible locally by Internet Service Providers and other means.

BUYER WEB SERVER **A500** is a standard server that serves web pages (which may contain HTML, Java, ActiveX and other constructs). Such servers may run applications such as Apache, Microsoft IIS, Netscape SuiteSpot, or other web server software. It is used to provide access to web pages to buyers and others using BUYER INTERFACE **A400** or the like.

HTML DATA INTERFACE METHOD SERVER **A600** is used to interface with the SELLER WEBSITE **A700** by reading HTML and other web pages utilizing the Internet or by other well known methods to send and receive such data. It has a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers.

SELLER WEBSITE **A700** is a standard server that serves web pages (which may contain HTML, Java, ActiveX and other constructs). Such servers may run applications such as Apache, Microsoft IIS, Netscape SuiteSpot, or other web server software. It allows users of the INTERNET to access sellers' websites.

DIRECT DATABASE ACCESS METHOD SERVER **A800** is used to interface directly with the seller database **A900** using the Internet or other methods to

send and receive such data. It has a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers.

5 SELLER WEB SERVER **A1000** is a standard server which serves web pages (which may contain HTML, Java, ActiveX and other constructs). Such servers may run applications such as Apache, Microsoft IIS, Netscape SuiteSpot, or other web server software. It is used to provide access to web pages to sellers using SELLER INTERFACE **A1100** or the like.

10 SELLER INTERFACE **A1100** is typically a standard computer, such as those which run the Microsoft Windows or Apple Macintosh operating systems, but could also be a network computer (a simple terminal with a small operating system), a screen based telephone, a WebTV box (or similar) or other devices which could be used to interface with information on the World Wide Web of the Internet. Such  
15 device may use a modem (line, cable, satellite, ADSL, wireless etc.) or network adapter to a Local Area Network connected to the Internet, to interface with information on the Internet. The SELLER INTERFACE **A1100** may use an Internet Service Provider to connect to the Internet, but may utilize other means as well. A  
20 seller would typically utilize such a device in order to view and interact with web pages.

CORE NETWORK **A1200** contains most of the database and other servers directly involved in running the auction and other parts of the service.

5 NATURAL LANGUAGE INTERPRETER SERVER **A1210** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers, as well as a natural language interpreter application and several databases required for understanding natural language.

10 BUYER DATABASE SERVER **A1220** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers, as well as a database application (such as those from Oracle). Buyer information, such as buyer demographics, buyer behavior, open profile standard data etc., is stored and retrieved here.

15

PRODUCT QUALIFIER DATABASE SERVER **A1270** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as a database application (such as those from Oracle). It contains information on categories used to qualify products

(such as those from Consumer Reports or other sources of product and service reviews).

5 SHOPPING ENGINE SERVER **A1230** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as a web-based shopping engine application, and also may contain a database application (such as those from Oracle), and product and seller databases, including both affiliated and unaffiliated sellers. It retrieves and may  
10 organize information on products from various sellers, including, without limitation, the price, product features, brand, delivery time, warranties, shipping costs, financing, and seller reputation.

15 SELLER RULES DATABASE **A1240** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as a database application (such as those from Oracle). It contains rules which affiliated sellers have set in relation to limits and other constraints on how seller offers on products or services will be made to buyers through the auction process. This database need not reside within the core network **A1200**. It could, for example, also reside at a secure seller site.



VALUE-ADD DATABASE SERVER **A1290** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as a database application (such as those from Oracle). It contains information on value added products or services or other offers which may be combined with seller offers in order to enhance the overall offering to the buyer.

AUCTION ENGINE SERVER **A1250** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as an auction engine application, and also may contain a database application (such as those from Oracle), and a database of algorithms used for various product categories as required. The server conducts the auction and generates and stores results and reports for sellers.

THIRD PARTY DATABASE SERVER **A1280** contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , as well as a database application (such as those from Oracle). It contains information on third party ratings of products and/or services which can be utilized in the auction process depending upon buyer-selected priorities.

BILLING SERVER A1260 contains a CPU, memory, disk drive, operating system, network adapter (such as Ethernet) and other components typical of network servers , and may also contain a database application (such as those from Oracle). It collects and maintains billing records. It may process bills to invoice affiliated sellers based upon a variety of criteria, including , without limitation, completed sales, charges for participating in auctions, or charges for proprietary and/or non-proprietary information.

## *II. System Operation*

The preferred embodiment includes several methods for buyers to navigate through the process, which depend on the buyer's level of expertise. Buttons can be selected which give more information or which skip several steps altogether to take the buyer directly to the auction itself, depending upon buyer preference.

FIG. 23 illustrates an exemplary embodiment of the present invention in which communications between buyers and sellers take place over the Internet, with buyer web server A500 and seller servers A600, A800 and A1000 acting as

intermediaries. The buyer logs on to buyer web server **A500** and creates a request for offer (RFO) **10**. RFO **10** is made available to seller rules **60** that had been previously defined by sellers, transmitted to seller web server **A1000**, and stored within core network **A1200**. An auction is run within the core network, taking into account the RFO **10**, seller rules **60**, and, potentially, some third party information. Buyer web server **A500** sends sellers' initial offers **40** and/or adjusted offers **50** to the buyer, who decides whether or not to proceed with the transaction. If a transaction is concluded, purchase announcement **30** is communicated to the seller.

FIGS. 24 through 27 are flow charts illustrating the process by which the buyer formulates RFO **10**, requests and receives initial offers **40**, specifies her preferences **20**, requests and receives adjusted offers **50**, modifies her RFO **10** or preferences **20** based on adjusted offers generated by the system, and carries on the transaction. It is assumed that buyer had already established a connection with buyer web server **A500**, through buyer interface **A400**. Any computer capable of running web browser software, such as Netscape Navigator or Microsoft Internet Explorer, can serve as buyer interface **A400**. The actual process of establishing such an Internet connection to server **A500** is well-known, and need not be described further here.

At step **100** in FIG. 24, the buyer creates an RFO **10**. In a preferred embodiment, video monitor **A405** of buyer interface **A400** displays a form similar to

U100. In the form U100, a buyer enters a description of the product or service she wants to purchase, the description preferably being made in natural language. The description may include the type of product, requested features, warranty period, financing needs, delivery preference, and any other attribute the buyer wishes to include. The description, however, can be also very general. For example, the buyer may specify that she is looking for products enabling her to watch movies or for products enabling her to store food, rather than specifying particular items like VCRs and DVD players or refrigerators and kitchen cabinets, respectively. The description is received by buyer web server A500, which passes it to natural language interpreter A1210, embedded within core network A1200, to convert it into a format that shopping engine A1230 can later process. In another embodiment, the buyer selects the product category and features from a pre-defined on-screen or pull down menu, which may be hierarchically structured.

At step 150, the buyer decides whether or not she wants to request information or advice on a product or category of products. This may be done, for example, by clicking on the "learn" button in form U100. In another implementation, information is displayed automatically, depending on the vagueness of the buyer's description. Descriptions that do not include a precise specification of a product or service, but only an area of interest, are treated to suggest the buyer needs to be informed about products or services in that area. In yet another

implementation, the buyer may actually begin with step 150, and proceed to step 100 only after having been educated about products fitting her needs.

At step 170, video monitor A405 displays requested research or advice, through a form similar to U200. The research or advice is supplied to buyer interface A400 by third party data server A1280, through buyer web server A500. The information supplied based on the research request can vary in its complexity. For example, without limitation, the information can be as simple as an article explaining the available features of new products and the differences among them or as detailed as a table summary with feature-by-feature product comparisons like those often shown in consumer magazines (e.g., Consumer Reports). Advice can range from a mere recommendation of a brand name, to a full stipulation of product's essential features, or to summary statistics showing the popularity of various products among users of the present invention.

At step 200, the buyer can optionally delimit the scope of seller search, through a form such as U400 or U410, which may be accessed by selecting the "look only" button on form U100. A wide variety of constraints can be placed on the search. For example, the buyer can limit eligible retailers to only those within a local geographical area, state, or country. She can also exclude retailers from a particular geographical area, e.g. "everything but California". Another limit may be imposed by specifying the highest price the buyer is willing to pay, or the shortest period of

warranty service. The buyer can also insist on including in the search only those retailers that were ever rated by reputable agencies, or reviewed by major magazines, or earned a high reputation from other buyers, possibly with similar demographic characteristics. The buyer's constraints are stored in the Buyer Database Server

5 A1220. In an alternative embodiment, step 200 may be omitted. In yet another alternative embodiment, step 200 can be embedded after step 300.

At step 250 the buyer may choose to proceed directly to the specification of her preferences and the actual auction, both of which are described later in this section. This may be done by clicking on the "go!" button in form U100, form U400, or form U410. The choice is for convenience to repeat buyers, who are familiar with the interface and aware of the time saved by using this shortcut. In another embodiment of the system, it need not be implemented. By clicking "my choices" in form U410 in buyer interface A400, the buyer does not proceed directly to the auction, which makes the present invention comparable in "look and feel" to current Internet shopping engines, thereby lowering the switching costs to users.

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At step 300, shopping engine server A1230 queries product qualifier database server A1270, and retrieves offers that satisfy most or all of the criteria specified in RFO 10. The results of the search, initial offers 40, are passed to buyer interface A400, where they are displayed in form U600. Sellers offers may either be

20 precompiled and stored on product qualifier database server A1270, or server A1230

may request them and compile them on the fly from seller web server **A1000**, direct database access method server **A800**, or HTML data interface method server **A600**.

5 The buyer may sort returned initial posted offers **40** in **U600** by price, delivery time, store distance, seller name, manufacturer name, model number, etc., by clicking on the appropriate buttons. In another embodiment, the posted offers could be sorted by a score that is automatically imputed to each offer, as described in greater detail in step **380**.

Optionally, the system could, at this stage, enrich the list of initial offers by a list or browser window displaying complementary goods or services.

10 Complementary or substitution products may, without limitation, be identified by analysis of buying habits of consumers or by the application of a collaborative filter to the buyer's request. In other embodiments, similar suggestions could be made, without limitation, at steps **380**, **1300**, **1620**, or **1900**.

15 At step **350** the buyer can revise her RFO **10**, by displaying the form **U100** (or a similar form) again. This helps in situations in which RFO **10** was stipulated too narrowly, with shopping engine **A1230** returning only a few or no initial offers **40**, or too broadly, when hundreds of offers **40** were returned **U600**. Alternatively, this step can be omitted, leaving buyers to use other methods to return to step **100**, such as pressing the web browser's "back" button.

At step 370, the buyer asks for a recommendation from among the initial offers 40, for instance, by clicking on the "make a recommendation" button in form U600. Alternatively, the recommendation may be generated automatically, without the buyer's prompt, when the posted offers are initially displayed.

5 At step 380, the recommendation is displayed by buyer interface A400 in a suitable form. A possible form is shown in U700, wherein a numerical score is calculated for each initial offer 40 and offers are sorted in descending order. Such a score could, for example, be based in part on the ranking of the product by Consumer Report and/or other magazines, or it could be based in part on its popularity among  
10 other buyers, as determined from records of purchases.

At step 400 buyer chooses to proceed with an auction or to make an immediate transaction. In one embodiment, buyers conducting immediate transactions (i.e., not using the auction component of the present invention) do not need to identify themselves because they transfer to the seller's web site to conclude the transaction, while buyers requesting adjusted offers 40 must be registered. In  
15 alternative embodiments, all buyers may be required to conclude every transaction in-situ, thus requiring identification from all of them. In yet another embodiment, all transactions may be concluded directly with the seller, for example at his website, thus requiring no registration from any buyer at the Auctioneer site.



At step 500, the System checks whether the buyer has registered with buyer web server A500 before. If not, a standard registration form U800 is displayed on buyer interface video monitor A405, in which the buyer identifies herself. This step can also be automated, for example by using browser cookies, thus demanding no action on the buyer's part.

In the present embodiment, registration and identification are used to create and invoke buyer's profile, stored within buyer database server A1220. A simplified version of the system may not require step 500. Instead, buyers could re-enter information concerning their priorities every time they use the simplified system.

At step 600, the buyer completes a registration process. Buyer web server A500 instructs buyer database server A1220 to open a new "account", and the buyer sees, for example, a form such as U1300 on her monitor A405. The buyer or her proxy enters information about the buyer which can include, without limitation, basic personal demographic information, billing and shipping addresses, and credit card information, which are stored in buyer database A1220. The buyer's account information is preferably accessible to the buyer from any user interface so that it can be updated or modified by the buyer at any time.

Form U1300 makes accessible other forms, like U1310, U1320, U300, or U310. Form U1310 displays an example of buyer's archive record, showing all transactions that the buyer made within the system. Form U1320 shows a report of a

rewards program. Sellers may offer benefits in terms of a reward program to the buyer, as part of their bidding strategy and/or in exchange for information about the buyer. Forms **U300** and **U310** deal with the buyer's priorities and are discussed later in this section.

5           At step **700**, the buyer chooses whether to create a new set of priorities **20** or to use her priorities **20** stored in her account on buyer database server **A1220**. For example, buyers who frequently purchase the same or similar goods may benefit from using their stored priorities **20**, which had already been optimized. At step **800**, buyer web server **A500** contacts buyer database **A1220** to recover stored priorities  
10 **20**. They are, in turn, passed to buyer interface **A400**, and displayed in a form such as **U300**. The sliders in form **U300**, which correspond to the buyer's priorities for product or service features, can assume their positions from the last transaction, or their positions when last stored in the buyer's account.

15           At step **1000**, buyer's approval of the recovered priorities **20** is sought. In form **U300**, the priorities **20** may be approved by clicking on the "go!" button. At step **1100**, the buyer modifies recovered priorities **20**. This modification can be done in a wide variety of ways. For example, the modification can be made by adjusting the sliders in an exemplary form **U300**. It can also be made with the aid of an expert system, as illustrated by the "decide for me" button on form **U310**. The expert  
20 system may run on buyer database server **A1220**, or any other server within core

network A1200, or be dedicated to its own server. The expert system may, for instance, analyze the buyer's transaction record and infer the most likely priorities 20 that would have generated such a record. It may also base its suggestion on the average or median priorities 20 of a group of buyers with similar demographic characteristics.

At step 900, the buyer creates a new set of priorities 20 by moving sliders within form U300. Sliders are just one example of the many ways that could be used to enable a buyer to set her priorities. Other methods of setting preferences are well known to those of ordinary skill in the art and need not be described in detail here. Optionally, expert system aid may be available at step 900.

At step 1150, buyer instructs buyer web server A500 to store the new or modified priorities 20 in her account within buyer database A1220. The actual storing of priorities 20 is done in step 1175.

At step 1180, the buyer can optionally put restrictions on displayed auction results. For instance, as shown in an exemplary form U810, the buyer can limit the number of adjusted offers 50 to be displayed, or provide a cut-off point for adjusted offers 50. Buyer may also be reminded at this step of the restrictions created in step 200, in forms U400 and U410. In another embodiment, step 1180 may be omitted.

At step 1200, auction engine server A1250 runs a buyer's auction. The detailed description of the auction process is provided later below using FIG. 28 with steps 1210 through 1280.

5 In certain cases, as in U910, utilizing A1290, it may be beneficial for the Auctioneer (the buyer's auction service provider) to attach value added products or services or other offers which may be combined with seller offers to enhance the overall offering to the buyer. This may also give the perception to the buyer that all offers are adjusted whether or not they are from affiliated sellers.

10 At step 1300, a list of final adjusted offers 50, with their scores, is returned to the buyer web server A500 by auction engine server A1250. It is passed to buyer interface A400, through an exemplary form U900. The results may be sorted in a wide variety of ways, including without limitation, by the score each adjusted offer 50 earned, by price, or by model number.

15 At step 1400 buyer determines whether to proceed or to modify her priorities 20. For instance, by clicking on the "adjust my priorities" button in form U900, the buyer returns to step 700. The loop gives the buyer a quick way to learn how different sets of priorities 20 affect the resulting adjusted offers 50. Step 1400 is not essential, other embodiments need not contain it.

At step 1450, buyer may revise her RFO 10. Revision is accessible, for example, by pressing the "I want to ..." button in form U900.

At step 1460, buyer can choose to employ an automated bot. The bot enables the buyer to automate recurring transactions. It can alert the buyer when the transactions are supposed to be undertaken and/or it can enable the buyer to search for buyer-specified offers that are unavailable at the present time, but which are likely to appear in the future. The bot may run on buyer web server A500, however, it can also run on a dedicated server (not displayed) within core network A1200. The choice of using an automated bot can also be made available to the buyer at other points in the process.

At step 1470, buyer sets parameters for the bot, as illustrated in exemplary form U500. For instance, the buyer can specify, without limitation, the length of time for the bot to be active, the means of notification of the buyer, or whether or not the transaction can be made by the bot on the buyer's behalf.

At step 1500, the buyer can elect to see an analysis of final adjusted offers. The analysis is provided to help the buyer better understand the influence of priorities 20 on adjusted offers 50. It may be accessible via the "explain" button in form U900, or in any other suitable way.

At step 1600, analysis of adjusted offers is performed and displayed. In one embodiment, buyer's monitor A405 displays exemplary form U1100, which shows

adjusted offer **50** evaluated with respect to buyer's priorities **20**. Optionally, or in another embodiment, buyer web server **A500** uses adjusted offers **50** and buyers priorities **20** to compute the critical factors that made a particular offer inferior to the highest-score offer. Yet, in another embodiment, buyer's monitor **A405** displays a table that lists all attributes of the adjusted offers **50**, together with buyer's priorities **20**, and explicitly shows how the scores were calculated.

At step **1620**, the buyer can request expert suggestions. The suggestions may be based on numerous factors, including, without limitation, results of product or service testing by independent third parties, recommendations of major magazines, or reputation points given by the other users of the present invention. It can also take the form of recommending a complementary product, as described earlier. For example, a buyer interested in a home theater system can be informed that most other people buying home theater systems also buy speaker stands.

At step **1640**, the actual suggestion is generated and displayed. In one embodiment, buyer web server **A500** queries third party database server **A1280** for results of testing, or for third party recommendations. It also queries buyer database server **A1220** to identify other products and/or services that are commonly purchased with the product or service returned in adjusted offers **50**. Typical results of a suggestion search are displayed in exemplary form **U1200** on buyer's monitor **A405**.

At step 1700, the buyer can make a decision to purchase. This can be done, for example, by clicking on a "buy me!" button in form U900. Foregoing a purchase makes buyer web server A500 store buyer's RFO 10 for potential later use. The buyer may alternatively click a "talk to a rep" button in form U900 to be connected, either telephonically or electronically to a seller representative, who could potentially answer questions in regards to the product or service in question.

At step 1800, the transaction is executed. In the preferred embodiment, buyer web server A500 receives buyer's billing information from buyer database server A1220, and relays it to buyer interface A400 for confirmation. For example, form U1000 may be shown on buyer's monitor A405, asking the buyer to either confirm or modify her billing and shipping information. Upon confirmation, purchase 30 is received by buyer web server A500 and relayed to billing server A1260 for further processing.

Billing server A1260 sends purchase 30 to HTML data interface method server A600, or direct database access method server A800 (possibly utilizing a proprietary standard), or to seller web server A1000 depending on the seller's setup. Purchase 30 is then received, respectively, by seller website A700, seller database A900, or seller interface A1100. For example, a purchase notification mediated by seller web server A1000 may look like that in form U3500. Purchase announcement 70 notifies the winning seller that a transaction has been made on his behalf. Also,

billing server **A1260** credits the seller's account, while applying agreed upon charges for a closed transaction.

5 In an alternative embodiment, if users of the present invention are not required to register but are required to perform the transaction in-situ, then step **1900** would consist of the buyer inputting billing and shipping information, with the rest of the process being the same as that described above.

10 In yet another embodiment, if buyers complete the transaction at the winning seller's website, then step **1900** would consist of buyer web server **A500** determining which seller was chosen by the buyer, and instructing billing server **A1260** to charge that seller a success fee.

15 FIG. **28** illustrates an exemplary embodiment of the process by which auction engine server **A1250** generates adjusted offers **50**. The process involves the use of buyer's RFO **10**, her priorities **20**, the sellers' business rules **60**, and a set of auction rules. The auction rules are preferably specified by the Auctioneer service provider, but can also be specified by the buyer or any other appropriate party. Optionally, third party information can be used in the auction process, as explained below.

At step **1210**, auction engine server **A1250** receives buyer's RFO **10** and her priorities **20** from buyer web server **A500**.



At step 1220, auction engine server A1250 queries seller rules database A1240, and obtains business rules from those affiliated sellers that could potentially satisfy RFO 10. In addition, third party information can be requested from third party database server A1280. For example, ratings information from a third party service (e.g., Consumer Reports) can be obtained if the buyer has limited her choices to only those products or services that have received a favorable review from such a rating service. Furthermore, information from past users of the present invention can be obtained from buyer database A1220. For example, a list of products and services that have received fewer than 20 complaints from previous buyers using the Auctioneer can be obtained if the buyer has limited her choices to only those products or services that have not generated complaints by previous buyers. Simplified embodiments of the present invention need not include all of the various forms of information. Alternatively, auction engine A1250 can just obtain the business rules of sellers who satisfy all restrictions imposed by the buyer. Auction engine A1250 may also receive constraints imposed by the buyer on participating sellers, as specified in step 200, or limitations on bidders and auction outcomes, as specified in step 1180. Those steps are, however, not necessary. In another embodiment, the restrictions may be applied by buyer web server A500 after adjusted offers 50 have been generated, for example at step 1300.

At step 1230, the auction engine server A1250 retrieves the auction rules previously stored on the auction engine server A1250 by the Auctioneer service

provider. Alternatively, the auction engine server **A1250** can receive auction rules specified by the buyer from buyer web server **A500**.

At step **1240**, initial offers **40** are evaluated according to buyer's priorities **20** and a best initial offer is determined. The evaluation may involve weighting initial offers **40** by linear weights constructed from buyer's priorities **20**. Many other weighting techniques are admissible, however, such as non-linear weighting, and need not be described in detail here.

At step **1250** an adjustment of seller offers is performed. Seller business rules **60** are used to modify initial offers **40**, or adjusted offers **50** made in a previous round. Seller business rules **60** can optionally respond based on information about the seller offers from the previous round. More thorough specification of seller business rules **60** is discussed below, with respect to FIGS. **29 – 30**.

At step **1260**, adjusted offers **50** of the present round are evaluated. In the preferred embodiment, the evaluation is identical to that in step **1240**. In alternative embodiments, however, it can be different. The evaluation may be used, for instance, to determine whether a seller's adjusted offer **50** is admissible. The criteria for admissibility of adjusted offer **50** are part of the auction rules, and can be very general.

At step **1270**, the status of the auction is compared with auction rules obtained in step **1230**. If auction rules indicate the auction has not reached an end, it

continues to loop. For example, an auction that ends when no seller makes an improving offer may loop several times.

At step **1275**, value-added product or services can optionally be added to affiliated or unaffiliated sellers' offers.

5 At step **1280**, the process on the auction engine server terminates, with final adjusted offers **50** being transmitted to buyer web server **A500**.

FIGS. **29** and **30** describe the process by which the seller creates and stores his business rules for the auction and obtains information, or analysis of information, generated by the present invention. It is assumed that the seller had established an Internet connection with seller web server **A1000**, through seller interface **A1100**. Any computer capable of running Internet browser software can be used to establish this connection.

10 At step **2000**, the seller signs in to seller web server **A1000** using seller interface **A1100**. The process of signing in involves the seller supplying any valid identification to access his account on seller rules database server **A1240**. The account on seller rules database server **A1240** had been previously created by the maintenance staff of the System, based on an affiliation agreement with the seller. The agreement can, for example, be reached using mail, email, fax, Internet form

subscription, or any other means of communication capable of supporting legally binding agreements.

For cases in which the affiliation agreement is reached over the Internet, the seller may be presented with forms similar to **U2000**, **U2100**, and **U2200**. Form **U2000** is an exemplary overview with links to sections discussing the rights and responsibilities accepted by the seller and the entity running the present invention. Form **U2100** illustrates possible types of affiliation. As mentioned in the "Product and Pricing" section of the Background, the present invention generates proprietary information. Different types of affiliation grant access rights to different bundles of proprietary information. Form **U2200** succinctly summarizes exemplary types of information available under each type of affiliation. In a simpler embodiment of the present invention, all sellers could have identical access rights to the information.

At step **2100**, the seller chooses whether to view information generated, or mediated by the present invention. All affiliated sellers have access to auction results, such as that described as near-perfect information in the Background of the Invention. The information may range from that which is also readily available from other parties, to information that can be, in principle, obtained in the absence of the present invention (e.g. buyers' needs, or priorities), to detailed information that is only generated by the present invention, listed, for instance, in the right column of form **U2200**.

At step **2200**, the seller specifies the information to view, in a suitable form displayed on seller's monitor **A1115**. This may include the area of products or services, the type of information, like RFOs **10**, or auction results **50**, the time period, and other constraints on requested records. Seller web server **A1000** automatically compares the seller's request against his affiliation agreement obtained from seller rules database server **A1240**, and invalidates the request if the seller's affiliation agreement prohibits access to the requested information. At step **2300**, seller web server **A1000** searches buyer database server **A1220**, or third party databases **A1280** and returns results as rules analysis **90** to the seller interface **A1100**. Forms like **U3000**, **U3100**, **U3200**, **U3400** or **U3500** can be used to display information on individual transactions that occurred within the present invention. Exemplary forms **U3000** and **U3100** pertain to buyer's information. Some of the buyer's information may only be accessed with the buyer's permission, e.g., in exchange for buyer loyalty program incentives (like frequent flier points). Forms **U3200** and **U3400** pertain to records of actual offers generated by the present invention, while form **U3500** displays the terms of the offer eventually accepted by the buyer. Form **U3600** displays aggregate information about and analysis of auctions occurring during a certain time interval.

At step **2400**, the seller can decide to use his business rules **60** in a simulated environment, giving him the opportunity to test them prior to committing to use

them. Using a simulated environment helps the seller discover whether his rules perform as intended.

At step 2500, the seller enters his business rules 60 into forms like U2300 or U2400. Form U2300 represents only an example of the way business rules 60 can be specified. These rules could also be driven by an electronic interface to another computer located on the seller's site which contains seller's own proprietary rule based system. Different sets of specifications can be allowed in different categories of products. Business rules 60 are sent by seller interface A1100 to seller web server A1000 and passed to seller rules database server A1240, however, they are marked "simulation-only" as they do not represent a binding commitment on the part of the seller.

At step 2600, a simulation is run inside core network A1200. In one embodiment, auction engine A1250 obtains the last n RFOs 10 and priorities 20 from buyer database server A1220 falling within the category to which the business rules apply. Auction engine A1250 then runs n auctions employing the seller's rules 60 against other sellers' rules. In a different embodiment, auction rules 60 are treated by auction engine A1250 as valid rules, except the offers generated by them are not made visible to the buyer within returned adjusted offers 50. After the simulation ends, seller rule 60 is invalidated by seller rule database server A1240.

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At step 2700, auction engine server A1250 sends simulation results 70 to seller web server A1000 for further processing. Seller web server A1000 passes results 70, or their analysis to seller interface A1100 where they are displayed on seller video monitor A1115. The results may show basic aggregate information about how the sellers simulated rules compared to other sellers' rules in all dimensions, as in form U3600, or information on how many auctions were won, and what were the priorities profiles to which the simulated rule most appealed.

At step 2800, the seller can continue to experiment with his business rules in the simulation by changing the parameters.

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At step 2900, the seller can modify his business rules 60 that he uses in actual (not simulated) auctions.

At step 3000, the affiliated seller enters or modifies seller business rules 60 in form U2300, in much the same way as in the simulated environment. The seller can adopt business rules that produced favorable results for him in a simulation.

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However, the modified rules do not have to be based on simulation results.

At step 3100, the seller decides to make new seller business rules 60 legally binding.

At step 3200, seller business rules 60 are sent to seller web server A1000 and permanently stored within seller rules database A1240 of core network A1200.

The various embodiments described above should be considered as merely illustrative of the present invention and not in limitation thereof. They are not intended to be exhaustive or to limit the invention to the forms disclosed. Those skilled in the art will readily appreciate that still other variations and modifications may be practiced without departing from the general spirit of the invention set forth herein. Therefore, it is intended that the present invention be defined by the claims which follow:

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*Added  
to  
the  
claims*